EFFECTIVENESS OF SWALLOWING EXERCISE ON SWALLOWING AND FEEDING PERFORMANCE AMONG TRAUMATIC BRAIN INJURY PATIENTS

DISSERTATION SUBMITTED TO

THE TAMILNADU Dr. M.G.R.MEDICAL UNIVERSITY, CHENNAI

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE

OF MASTER OF SCIENCE IN NURSING

MEDICAL SURGICAL NURSING

APRIL 2016

CERTIFICATE

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ACKNOWLEDGEMENT

I wish to express my humble thanks to **God Almighty** for his endless grace, love, care and blessings showered on me to complete and in presenting this dissertation successfully.

I express my honest and sincere gratitude to **Rev.Fr.Jaya Prakash, Correspondent** of St.Xaviers catholic college of nursing for giving me the precious opportunity to be a part of this esteemed institution.

I express my sincere thanks to **Rev.Fr. Godwin Selva Justus, Bursar** of St.Xaviers Catholic College of nursing for giving me the precious opportunity to be a part of his esteemed institution.

I express my heart full gratitude to **Dr.A. Reena Evency, M.Sc.(N).Ph.D., Principal**, St. Xavier's Catholic College of Nursing, Chunkankadai, for her valuable support, suggestions and direction to complete the study in a successful way.

I express my sincere thanks to my Research guide **Mr.A. George Joe Kumar, M.Sc (N),** class co-ordinator for his constant support, suggestions in department of Medical Surgical Nursing, for her constant support, suggestions and encouragement at each level of this study.

I express my respectful thanks to **Mrs.A.R.Nimi, M.Sc(N).,Associate Professor,** Medical Surgical Department, Chunkankadai, for her valuable suggestions and continuous support which made my study smooth and successful.

I extend my thanks to **Dr.A.Judie, M. Sc.,(N), Ph.D, Dean** of **S.R.M** College of Nursing, Chennai for her best guidance in the path of research activities.

It is the most pleasant time to express my sincere and exclusive thanks to **Rev.Fr.Stephen,** for his valuable suggestions which helped me to do my study in successful way.

I also take the opportunity to express my special thanks to **Mrs.Selestine Mary and Mrs.Sweety,** Librarian, St. Xavier's Catholic College of Nursing, Chunkankadai, for helping me to review and for extending library facilities throughout the study. I am very grateful to All **Faculty Members of St. Xavier's Catholic College of Nursing,** Chunkankadai, for their help and continuous support whenever needed.

I express my sincere gratitude to **Dr.Muthu Retnam,MS.M.D.(Neurosurgery) Consultant Neuro&Spine Surgeon,** Professor of Neurosurgery, Sree Chitra Thirunal Hospital , Trivandrum. for validating the tool, constant guidance and valuable suggestions.

I extend my thanks to the **advisory committee members of college** for their healthy criticism, supportive suggestions which moulded the research. I take this opportunity to thank all the **Experts** of medical surgical department who have done the content validity and valuable suggestion in the modifications of the tool.

I extend my sincere thanks to **Dr.G.Immanuel, Ph.D., Biostatistician**, for his support and guidance in statistical analysis and interpretation of data.

I extend my deep sense of gratitude to the **staff nurses in Muthu Neuro Centre and Kevin Neuro Centre and Patients** for their cooperation in completion of the study.

I express special thanks to **Shalom computer centre** for their excellent and untiring effort in materializing my dissertation work.

I would like to express my deep felt gratitude to **my parents, sister's, Brother in law and friends** for their fruitful prayers, endless patience, inspiration and support throughout this endeavour.

JASLINE SHINY.M

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ABSTRACT

A quasi experimental study was conducted to assess the effectiveness of swallowing exercise on swallowing and feeding performance among patients with traumatic brain injury in selected hospital at Kanyakumari district.

Quasi experimental, pre assessment and post assessment control group design was adopted. Samples were selected from Muthu Neuro Centre, Chunkankadai, Kanyakumari District, Kevin Neuro Centre, Vettunimadam, Kanyakumari District. By using purposive sampling technique. 30 samples were in study group, 30 samples were in control group.

Gugging swallowing screening scale was used to assess the level of dysphagia. For study group the investigator demonstrated swallowing exercise for 10 minutes three times a day for 5 days. For control group the hospital routine was followed. Post assessment was conducted on 6 day of the intervention.

During pre-assessment, in study group 14(46.67%) had slight dysphagia, 16(53.33%) had moderate dysphagia,none of them had no dysphagia,severe dysphagia. In control group 15(50%) had slight dysphagia, 15(50%) had moderate dysphagia.None of them had no dysphagia , severe dysphagia.During post assessment in study group 18(60%) had no dysphagia, 12(40%) had slight dysphagia, none of them had moderate dysphagia ,severe dysphagia. In control group 10(33.33%) had no dysphagia, 14(46.67%) had slight dysphagia, 6(20%) had moderate dysphagia.None of them had severe dysphagia.

In study group the mean score was 13.33 in pre assessment and 18.21 in post assessment. The estimated paired t test value was 7.18 which is significant at $p<0.05$. In control group, the mean score was 13.66 in pre assessment and 16.52 in post assessment. The estimated paired t test value was 4.21 which is not significant at $p<0.05$.In study group mean post assessment score of swallowing and feeding performance was 18.21.In control group the post assessment score of swallowing and feeding performance was 16.52.The unpaired t test value was 3.60, which is significant at $p<0.05$ level of significance.There is no significant association between the post assessment level of swallowing and feeding performance among traumatic brain injury patients in study group and control group with selected demographic variables and clinical variables at $p<0.05$ level. Hence hypothesis H_2 is not accepted. As per the study the researcher concludes that the swallowing exercise is effective and it improves the swallowing and feeding performance.

CHAPTER - I

INTRODUCTION

Health is the level of functional or metabolic efficiency of a living organism. In humans, it's the general condition of a person's mind and body, usually it means free from illness, or pain. The health is defined as" a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." The main determinants of health include the social and economic environment, the physical environment, and the person's individual characteristics and behaviour's.

A traumatic brain injury is any trauma to the scalp, skull, or brain. The injury may be only a minor bump on the skull or a serious brain injury. Traumatic brain injury can be either closed or open injuries. Traumatic brain injury is a common reason for an emergency room visit. A large number of people who suffer head injuries are children. Each year over 1 in 6 injuries were traumatic brain injury patients getting admitted in hospital.

Common cause of traumatic brain injury include, accidents at home, outdoor work, sports, falls, physical assault, traffic accidents. Most of these injuries are minor because the skull protects the brain. Some injuries are severe enough to require a stay in the hospital. Due to traumatic brain injury the patients will get mild, moderate and severe complaints. Some patients with traumatic brain injury stabilize and other patients deteriorate. Patients may present with or without neurological defect. Patients with concussion may have a history of seconds to minute's unconsciousness, then normal arousal, coma, confusion, drowsiness, personality change, seizures, nausea and vomiting, head ache and one of the most complaints is swallowing difficulty.

Swallowing is a complex act. Many nerves work in a fine balance to control how the muscles of the mouth, throat and oesophagus work together. A brain or nerve disorder can alter this fine balance in the muscles of the mouth and throat. Brain injury frequently affects the skilled coordination of the nerves and 26 different muscles in the neck and oesophagus that are used during the normal swallowing process, If any problem in this process the patients will get swallowing difficulty.

Dysphagia is the medical term for the symptom of difficulty in swallowing .The word is derived from the Greek 'dys' meaning 'bad' or 'disordered', and the root 'phag' meaning "eat". It may be a sensation that suggests difficulty in the passage of solids or liquids from the mouth to the stomach, a lack of pharyngeal sensation, or various other inadequacies of the swallowing mechanism. Dysphagia is distinguished from other symptoms including odynophagia which is defined as painful swallowing, and Globus which is the sensation of a lump in the throat. A psychogenic dysphagia is known as phagophobia.

BACKGROUND OF THE STUDY:

Any injury that results in trauma to the skull, or brain can be classified as a traumatic brain injury. The terms traumatic brain injury and head injury are often used interchangeably in medical literature. This broad classification includes neuronal injuries, haemorrhages, vascular injuries, cranial nerve injuries, and subdural haematoma, among many others. These classifications can be further categorized as open (penetrating) or closed head injuries. This depends on if the skull was broken or not. Because head injuries cover such a broad scope of injuries, there are many causes including accidents, falls, physical assault, or traffic accident it can cause head injuries. Many of these are minor, but some can be severe enough to require hospitalization.

Hindu newspaper (2013) in a survey done at Rajiv Gandhi government general hospital, Chennai, an average of 60 road traffic accidents victims is seen per day. Of these at least 20 have to be treated for head injuries and around six operated on.

Sher-i-kashmir Institute of medical sciences New Delhi, traumatic brain injury deaths were highest in age group of 21-30 years (18.8%). According to the Journal of trauma care centre Pondicherry in Tamil Nadu 66% 0f death due to traumatic brain injury.

The incidence (number of new cases) of head injury is 1.7 million people in the **United States** alone each year. About 3% of these incidents lead to death.

Trouble swallowing or moving food from the mouth to the stomach is called dysphagia. Dysphagia can put the person at risk of choking or having food going into the lungs (aspiration) instead of the stomach. Besides being very uncomfortable, aspiration can cause pneumonia and can be life threatening. The brainstem and the frontal lobe coordinate swallowing. The brainstem sends messages to and from the mouth, tongue, and throat. The brain frontal lobes control the muscle of the mouth, tongue and throat. There are factors that can affect how a brain injury affects swallowing.

A person who has trouble swallowing may need to get the nutrition through a nasogastric or gastrostomy tube. A nasogastric tube is a feeding tube that goes up the nose and down to the stomach. The feeding tube does not mean the patients cannot eat by mouth always. The tube just make sure that the patients get the proper nutrition and fluids until the patient can eat and drink well enough on his own, if this is essential. The duration of tube feeding is different from every one. Exercise, treatment, and positioning may help improve how well a person can chew and swallow. Instruction of safe swallowing techniques is very important.

Dysphagia is a serious problem because it can lead to malnutrition and aspiration due to this will lead to pneumonia.

SIGNIFICANCE AND NEED FOR THE STUDY:

The consequences of the traumatic brain injury may include physical, sensory cognitive communication, swallow and behavioural issues. These problems significantly impair the affected person's ability to live independently. The problem vary depending on how wide spread the brain damage is an the location of the injury .Swallowing defects may leads to weakness and in coordination of muscles in the mouth and throat. If the problem of swallowing and feeding performance are observed and evaluated then necessary recommendation regarding management and treatment are made. The focus of the evaluation will be to ensure that the individual is able to swallow safely and receive adequate nutrition. Additional swallowing test maybe recommended as a result of this evaluation. Swallowing exercise is a process of closing airway at the vocal cord level before and during the swallow. Swallowing is a complex mechanism using both skeletal

muscle and smooth muscles of the pharynx and oesophagus. The autonomic nervous system coordinates this process in the pharyngeal and oesophageal phases. In the human body the automatic temporary closing of the epiglottis is controlled by the swallowing reflex.

Swallowing exercise is the technique to facilitate swallowing of saliva, fluid and food, to meet the physiological needs of the body and to prevent complications of impaired swallowing. It has to be done for 5 days for 5 to 10 minutes three times a day. It includes various technique such as effortful swallowing, supraglottic swallowing, super-supraglottic swallowing. In the effortful swallow patients with traumatic brain injury are taught how to swallow their saliva as hard as they can. It helps to squeeze the swallowing muscles. They should perform this exercise 5 to 10 minutes, 3 times a day. In Supra-glottic swallow the patients with traumatic brain injury are taught how to take a deep breath, hold the breath, swallow the saliva, and then cough to clear any residues of saliva. They have to repeat this exercise with the food in their mouth. In Supersupra glottic swallowing exercise the patient with traumatic brain injury are taught how to take a deep breath, after taking deep breath bear down while swallowing, and then cough to clear any residues of saliva. They have to repeat this exercise with the food in their mouth.

Soft diet is recommended for the dysphagia patients. Foods allowed on the soft diet include mashed banana, mashed potato, mashed dhal, boiled and mashed apple are given.

Laura Barjens, Iris Zwijenberg., (2005) conducted quasi experimental study in evaluation of therapy in oro pharyngeal dysphagia-mandelsohn maneuver. A total of 46 patient's two groups one received pureed foods and non-altered liquids, other soft mechanical diet by using randomized controlled trials sampling. The result-91% of all subject were able to tolerate diet. The authors concluded that thicker food consistencies were likely to be safer for oral intake.

Seidl R O et al., (2007) performed a pre and post-intervention group study on a neurophysiologic dysphagia therapy for neurological patients at Germany. The study

was to investigate the success of a neurophysiologic dysphagia therapy in patients with neurological disorders. Facio-oral tract therapy led to a statistically significant increase in alertness during the treatment session and, over the entire therapy period to an increase in swallowing rate, alertness and swallowing ability. The decrease in alertness following therapy sessions must be taken into account in planning rehabilitative measures. Further studies on larger populations as well as studies currently in progress should further elucidate the strategies employed to rehabilitate dysphagia patients.

Swallowing exercise can improve the swallowing and feeding performance of the patients. When the researcher posted in Muthu Neuro centre she saw lot of traumatic brain injury patients admitted. In the traumatic brain injury patients, most of them had swallowing difficulty. So the researcher had the personal interest to do the research regarding the effectiveness of swallowing exercise on swallowing and feeding performance among patients with traumatic brain injury.

STATEMENT OF THE PROBLEM:

A study to assess the effectiveness of swallowing exercise on swallowing and feeding performance among patients with traumatic brain injury in selected hospital, Nagercoil, Kanyakumari district.

OBJECTIVES:

- To find out the pre assessment level of swallowing and feeding performance among patients with traumatic brain injury in study group and control group.
- To compare the post assessment level of swallowing and feeding performance among patients with traumatic brain injury between study group and control group.
- To associate the post assessment level of swallowing and feeding performance among patients in study group and control group with the selected demographic variables and clinical variables.

HYPOTHESIS:

H_1-There is a significant difference in the pre assessment level of swallowing and feeding performance between the study group and control group.

H_2-There is a significant difference in the post test level of swallowing and feeding performance between the study group and control group.

H_3-There is a significant association in post assessment level of swallowing and feeding performance among patients in study group and control group with the selected demographic variables and clinical variables.

OPERATIONAL DEFINITION:

Assess

Refers to the statistical measurement of level of swallowing and feeding performance among traumatic brain injury patients as measured by gugging swallowing screening scale.

Effectiveness:

It is the significant change by the swallowing exercise which improves the swallowing and feeding performance.

Swallowing:

Ability of patients to swallow soft food or drink any fluids which passes through the throat and oesophagus with voluntary muscular action. The soft foods such as mashed banana, mashed potato, mashed dhal, boiled and mashed apple are given through mouth while the patient is on nasogastric tube.

Swallowing exercise:

It is a technique to facilitate swallowing of saliva or any fluid by asking the patient to close the airway at the vocal cord level before and during swallow. It has to be done

for 5 days for 5 to 10 minutes three times a day. It includes various technique such as effortful swallowing, supra glottis swallowing, super- supra glottis swallowing.

Effortful swallowing:

The patients with traumatic brain injury have to swallow their saliva as hard as they can. It helps to squeeze the swallowing muscles. They should perform this exercise 5 to 10 minutes,3 times a day.

Supra-glottic swallowing:

The patients with traumatic brain injury have to take a deep breath with the soft food in the mouth, hold the breath, swallow the saliva, and then cough to clear any residues or food. They have to repeat this exercise without the soft food in their mouth for 5 to 10 minutes 3 times a day.

Super supraglottic swallow:

The patient with traumatic brain injury have to take a deep breath without soft food in the mouth, after taking deep breath bear down while swallowing , and then cough to clear any residues of saliva. They have to repeat this exercise with the soft food in their mouth for 5 to 10 minutes 3 times a day.

Feeding performance:

Improving the swallowing and feeding performance by providing the swallowing exercises as measured by Gugging swallowing screening scale.

Patients with traumatic brain injury:

Person admitted in the Muthu Neuro Centre and Kevin Neuro Centre who had met with road traffic accidents or sudden fall from height or other mechanical damage in the head and had obtained injury to skull, brain or cranium.

Patients:

Persons who were getting treatment for Traumatic brain injury between the age group of 20-60 years in Muthu Neuro Centre and Kevin Neuro Centre.

DELIMITATIONS

The study is delimited to

- Person with Traumatic brain injury with mild and moderate swallowing difficulty.
- Data collection was only for a period of 4 weeks.

PROJECTED OUTCOME:

Practising of swallowing exercise like effortful swallow, supraglottic swallow, super supraglottic swallow will increase the ability to swallow among the patients with traumatic brain injury. The study will help the nurse to provide swallowing exercise as an intervention to improve swallowing and feeding performance among patients with traumatic brain injury.

CONCEPTUAL FRAME WORK

Conceptual frame work provides clear description of variables suggesting ways or methods to conduct the study and guiding the interpretation, evaluation and integration of study findings,(wood and haber,1994).

The conceptual frame work is the device that helps to stimulate research and the extension of the knowledge by providing both direction and impetus,(**Polit andHungler,2004**).The conceptual framework for my study is based on general system theory of **Ludwig von bertalanffy (1996)**

According to Ludwig von bertalanffy a system is composed of a set of interactive elements and gets each system distinct from environment in which it exists. In all systems activities can be resolved in to an aggregation of feedback circuits such as input, through put and output. The feedback circuits helps in maintenance of an intact system.

Present study aims to assess the effectiveness of swallowing exercise on swallowing and feeding performance. The model consists of three phases:

1, Input : (phase 1)

It refers to the assessment of target groups with their demographic variables such as age, gender, education, occupation, marital status and clinical variables such as dysphagia, condition of oral cavity, types of feeding. The pre assessment of swallowing and feeding performance assessed in study group and control group with Gugging swallowing screening scale.

2, Through put: (phase 2)

It is second phase of process that occurs at some point between the input and output process, which enables the input to be transferred as output in such a way that it can be readily used by the system. In this study throughput refers to intervention phase that was the performance of swallowing exercise by traumatic brain injury patients in the study group to improve the swallowing and feeding performance through effortful swallowing, supra glottic swallowing, super- supra glottic swallowing.

3, Output: (phase 3)

The third phase is output. It refers to the energy, matter, or information that leaves the system. In the present study, output is considered as the level of dysphagia after the swallowing exercise in study group and control group that was done by post assessment using Gugging swallowing screening scale.

Feedback:

Feedback refers to the output that is returned to the system and it allows to monitor over time to a steady state known as equilibrium or homeostasis. Feedback may be no dysphagia, mild dysphagia, moderate dysphagia. In study group, feedback will be no dysphagia and mild dysphagia. For control group the feedback is obtained and the researcher will proceed to the pre assessment. The researcher taught the staff nurses regarding the swallowing exercises for the control group and upcoming new traumatic brain injury patients.

CHAPTER - II

REVIEW OF LITERATURE

Review of literature is a vital component of the research procsess.it gives the researcher orientation to the conduction of the study.it provides the source of research ideas for the new researcher.

The review of literature is defined as a broad comprehensive in depth, systematic and critical review of scholarly publication, unpublished scholarly printed materials, audio visual materials and personal communication.

Review of literature was an important step in the development of any research. The task of reviewing literature induces the identification, selection, analysing and reporting of existing information and the problem chosen for the study.

The review of literature is presented under the following sub headings. Review of literature is related to

Section-A: Studies related to dysphagia

Section-B: Studies related to swallowing exercise.

Section-c: Studies related to traumatic brain injury and swallowing and feeding performance.

Section-A: Studies related to dysphagia:

Ferrero Lopez, MI et al., (2012) conducted a prospective study on detection of dysphagia in the institutionalized elderly in Valencia, to determine the prevalence of dysphagia in a population of institutionalized elderly people, and the effectiveness of a clinical method for its detection on random patients with neurological disorders of elderly residents. A total of 62 cases were selected for this study. Study concluded that neurological disorders are common in elderly people.

Suntrup, S et al., (2012) performed a study on dysphagia in patients with acute striato capsular haemorrhage in Germany. Fiberoptic endoscopic evaluation of swallowing was carried out in 30 patients with acute striato capular haemorrhage in

which striato capsular haemorrhage, dysphagia is a common and so for under recognized symptom. FEES results indicate predominant impairment of oral motor control. Swallowing impairment is not related to other clinical deficits, stroke severity or lesion characteristics. Thus, detailed dysphagia assessment is indicated in all cases.

Bernice Ann ,Mathisen.,(2010) conducted a prospective cohort intervention study in using tongue –strengthening exercise programs in dysphagia intervention .A total of 60 patients in two groups by using randam sampling .The result showed that tongue -strengthening exercise has the potential to be a simple yet effective therapeutic tool to add to the options for swallowing rehabilitation in adults.

Ding R Logremann J A., (2008) performed a correlation study on patient self -perception of swallowing difficulties as compared to expert ratings of video-fluorographic studies in United States of America. One hundred and three patients who were referred for video-fluorographic swallow evaluation was included in the study. The correlation between patient self-perception and expert ratings of the video-fluorographic studies was established by comparing the results of patients self-reports with the results of the video-fluorographic studies. The results of this study demonstrated that patient self-perceptions of swallowing difficulties should be used as one of the criteria, but not the only one, in making referrals for further swallowing evaluation, especially in patients with neurological disorders.

Giselle D carnaby, Mann, Michael.,(2006) conducted a case control study to assess the effectiveness of Mcneill swallowing exercise program A total of 24 cases were individually matched to 2 separate controls for age, sex and primary medical diagnosis a result showed that dysphagia was reduced 65% in the Mcneil swallowing exercise program treatment group compared with the traditional therapy with bio-feedback group.

Nguyen N P et al.,(2005) conducted a study on severity and duration of chronic dysphagia following treatment for head and neck cancer at Dallas. To evaluate chronic dysphagia following treatment for head and neck cancer. Modified barium swallow examinations were performed in cancer-free patients who complained of dysphagia

following treatment for head and neck cancer. The severity of dysphagia was compared between first and last modified barium swallow study to determined whether the swallow function had returned to normal. The result of the study shows that excessive scarring following treatment may be responsible for the persistence and severity of dysphagia.

Hill M et al.,(2004) conducted a randomized and quasi-randomized study on treatment for swallowing difficulties in chronic muscle disease in United kingdom. The study is to determine the most appropriate intervention for dysphagia in people with chronic, untreated patients with neurological disorders, non-inflammatory muscle disease, a total of 72 cases were selected for this study. Among adult and children with chronic un treated patients with neurological disorders non-inflammatory muscle disease .There are no trials that have adequately evaluated treatments in the management of dysphagia for chronic muscle disease. It is therefore not possible to decide on the most appropriate treatment for a given individual based on current evidence.

Amindra S et al.,(2003) conducted a study on topical corticosteroid treatment of dysphagia due to eosinophilia esophagitis in adults. A total of 45 cases selected for this study. The diagnosis was based on the presence of a “ringed oesophagus” or a tapered distal oesophagus on upper endoscopy as well as the presence of a dense eosinophilic infiltrate on oesophageal biopsy. All patients were treated with topical corticosteroids, and follow-up was performed by telephone interviews. Eosinophilic esophagic is an entirely associated with food dysphagia and a ringed and smooth distal appearing oesophagus. This study found no association with gastro esophageal reflux symptoms .topical corticosteroid therapy was effective.

Section-B: studies related to swallowing exercise:

Terre R Mearin F et al.,(2012) conducted a randomized ,cross-over study to assess the effectiveness of chin-down posture to prevent tracheal aspiration in dysphagia secondary to acquired brain injury in Spain. A video-fluoroscopically study was conducted on 47 patients with a VDF diagnosis of aspiration and 25 controls without aspiration. Only half the patients with acquired brain injury avoided aspiration during

cervical flexion ,48% of silent aspirations continued to aspire during the maneuver . Therefore, the indication for chin-down posture should be evaluated by video-fluoroscopic examination.

Carnaby-Mann G D et al., (2010) conducted a case control study on McNeill swallowing exercise program in Gainesville.the study was to compare the effectiveness of the McNeill swallowing exercise program, a systematic exercise based rehabilitation framework for swallowing remediation ,with traditional swallowing exercise techniques paired with surface electromyography biofeedback. dysphagia patients referred to an outpatient swallowing exercise service .The McNeill swallowing exercise program resulted in superior outcomes compared with traditional swallowing exercise supplemented with surface electromyography biofeedback.

Seidl R O et al., (2007) performed a pre and post-intervention group study on a neurophysiologic swallowing exercise for neurological patients at Germany. The study was to investigate the success of a neurophysiologic swallowing exercise in patients with neurological disorders. A total of 56 cases were selected for this study. Facio-oral tract therapy led to a statistically significant increase in alertness during the treatment session and, over the entire therapy period to an increase in swallowing rate, alertness and swallowing ability. The decrease in alertness following therapy sessions must be taken into account in planning rehabilitative measures .further studies on larger populations as well as studies currently in progress should further elucidate the strategies employed to rehabilitate dysphagic patients.

Maggie-Lee Huckabee,et al., (2005) performed a correlational analysis on sub mental surface electromyography measurement and pharyngeal pressures during normal and effortful swallowing at California. The study was to evaluate the influence of 2 dysphagia manoeuvre's on anterior supra hyoid surface electromyography measurement and pharyngeal mono meric pressure. Effortful swallow generated greater surface electromyography amplitudes than normal swallowing.

Susan G. Hiss et al.,(2005) conducted a meta-analysis on timing of pharyngeal and upper oesophageal sphincter pressures as a function of normal and effortful

swallowing in young healthy adults at United states of America. Eighteen adults, nine males and nine females, participated Timing of pharyngeal pressure and onset and duration of UES relaxation were measured across ten trials of normal and ten trials of effortful swallows. The first and second statistical analysis investigated the pharyngeal pressure and UES relaxation onsets and durations, respectively. Both analysis identified significant interaction of swallow type by manometer sensor location. Furthermore the effortful swallow elicited longer pharyngeal pressure and UES relaxation duration, yet the pressure duration measured in the upper pharynx was significantly longer than that measured lower in the pharynx. These findings offer insight as to the potential positive and negative influence of the effortful swallow on pharyngeal timing.

K L Depippo,M.S., (2004) conducted a randomized control trial study on swallowing exercise following stroke in America. The study was to determine the effect of graded levels of intervention by a dysphagia therapist on the occurrence of pneumonia dehydration, calorie-nitrogen deficit, recurrent upper airway obstruction, and death following stroke. Limited patient and family instruction regarding use of diet modification and compensatory swallowing techniques during inpatients rehabilitation is as effective as therapist control of diet consistency and daily rehearsal of compensatory swallowing techniques for the prevention of medical complications associated with dysphagia following stroke.

Liza Blumenfeld., (2003) conducted a comparative study to evaluate the effects of transcutaneous electrical stimulation versus traditional swallowing exercise at California .the purpose of this investigation was to critically evaluate the efficacy of electrical stimulation in treating persons with dysphagia and aspiration . The results of the study suggest that swallowing exercise with transcutaneous electrical stimulation is superior to traditional dysphagia therapy alone in individuals in a long-term acute care facility.

Han TR Paik NJ Park JW.,(2001) conducted a qualitative study on quantifying swallowing function after stroke in korea.to develop a sensitive , specific scale for quantifying functional dysphagia in stroke patients , using results obtained from video fluoroscopic swallowing studies. A total of 65 cases were selected for this study. Data

collected were from collected. A dysphagia clinic in a department of rehabilitation medicine at a tertiary care university hospital. This functional dysphagia scale, which was based on a video fluoroscopic swallowing study in stroke patients, is a sensitive and specific method for quantifying the severity of dysphagia.

Section-C: Studies related to traumatic brain injury and swallowing and feeding performance

Natasha A. Laninin, Anne cuicle.,(2013) conducted a retrospective clinical study in recovery of neuro behavioural function in patients with brain injury. A total of 37 adult in patient from the 31 men and 6 women with a diagnosis of traumatic brain injury by using purposive sampling. The result showed that the patient neuro behavioural function such as feeding performance improved while given the intervention.

Arts, M. P Rettig T C et al .,2013) conducted a quasi-randomized study to maintaining endotracheal tube cuff pressure at 20 mm Hg prevent dysphagia after anterior cervical spine surgery in Netherlands .In the control group endotracheal tube cuff pressure is not adjusted after retractor placement. In the intervention group endotracheal tube cuff pressure after retractor is maintained at 20mm hg and air is withdrawn when cuff pressure exceeds 20 mm. postoperative dysphagia occurs frequently after anterior cervical spine surgery .This may be related to high endotracheal tube cuff pressure. Whether adaptation and maintaining the pressure after placement of the retractor will decrease the incidence of dysphagia has to be determined by this trial.

John ashford, Danielmccabe.,(2009) conducted a case control design study in or pharyngeal dysphagia behavioural treatment. A total of 820 patients from this dementia 43%,CVA 6%,cerebral ataxia 3%, traumatic brain injury 1% by using the purposive sampling techniques. The result of the study is swallowing maneuivers prevent the risk of aspiration.

BogaardtH et ., (2009) conducted a experimental study to use of neuromuscular electro stimulation in the treatment of dysphagia in patients with multiple sclerosis in Amsterdam. The effects of neuromuscular electro stimulation on the swallowing

function of patients with multiple sclerosis and swallowing problems. Twenty-five patients with multiple sclerosis and swallowing problems were treated for 3 weeks with 2 sessions per week of neuromuscular electro stimulation. The result of this study is that the treatment of swallowing problems with neurological disorders was successful in the reduction of pooling of saliva and in the reduction of aspiration .No adverse effects of the treatment were reported.

Yakoub D et al., (2008) conducted a meta-analysis on evidence-based choice of esophageal stent for the palliative management of malignant dysphagia in United kingdom. Twelve studies that included 911 patients compared metallic and plastic stents and eight studies that included 564 patients. The type of stent used for the management of patients with malignant dysphagia is chosen according to subjective physician's preference. The result showed that self-expanding metallic stents are superior to plastic stents in terms of stent insertion –related mortality, morbidity, andquality of palliation.

Laura Barjens, Iris Zwijenberg., (2005) conducted quasi experimental study in evaluation of therapy in oro pharyngeal dysphagia-mandelsohn maneuver.a total of 46 patients two groups one received pureed foods and non-altered liquids ,other soft mechanical diet by using randomized controlled trials sampling. The result-91% of all subject were able to tolerate diet. The authors concluded that thicker food consistencies were likely to be safer for oral intake.

CHAPTER - III

METHODOLOGY

This chapter deals with the methodology adopted in this study. It includes the research approach, research design, variables, population, sample, settings, sample size, sampling techniques, criteria for sample selection, description of the tool, content validity, pilot study, reliability, method of data collection, data collection procedure and plan for data analysis.

RESEARCH APPROACH:

The study utilized quantitative research approach.

RESEARCH DESIGN:

Quasi -Experimental, pretest and posttest control group design.

GROUP	**PRE ASSESSMENT (phase 1)**	**INTERVENTION (phase 2)**	**POST ASSESSMENT (phase 3)**
Study group	01	X (swallowing exercise)	02
Control group	01	---	02

01 – Assessment of swallowing and feeding performance before intervention

X – Swallowing exercise for 5 days for 5 to 10 minutes three times a day

02 – Assessment of swallowing and feeding performance after 6^{th} day of intervention

Variables

Independent variable in this study is swallowing exercise

Dependent variable in this study is swallowing and feeding performance

Setting of the study

Setting selected for the study were Muthu Neuro Centre, Chunkankadai, Kanyakumari District, Kevin Neuro Centre, Veturnimadam , Kanyakumari District.

Muthu Neuro Centre. Which is 1km away from St. Xavier's Catholic College of Nursing, Chunkankadai. It is a 50 bedded hospital with monthly 35 -40 traumatic brain injury patients admitted.it is selected for study group as per researcher's convenience. Kevin Neuro centre is 9 km away from St.Xavier's Catholic College of Nursing. It is a 40 bedded hospital with monthly 30-35 traumatic brain injury patents admitted. This is for selected as control group. Then researcher prepared to do the purposive sampling technique for the data's.

POPULATION:

Target population

Patients with traumatic brain injury.

Accessible population

Patients who were admitted in Muthu Neuro centre, Kevin Neuro care centre, with the conditions of traumatic brain injury.

SAMPLE

Samples were selected from Muthu Neuro Centre and Kevin Neuro Centre who fulfilled inclusive criteria.

SAMPLE SIZE

The sample size consist of 60 patients with traumatic brain injury. Among these 30 patients with traumatic brain injury were in study group and 30 patients with traumatic brain injury in control group.

SAMPLING TECHNIQUE:

Purposive sampling technique was adopted for the study.

CRITERIA FOR SELECTION:

The patients were selected based on following inclusion and exclusion criteria.

1. **Inclusion criteria**
   - Traumatic brain injury patient with Glasgow coma scale score 9 or more.
   - Patients with mild and moderate dysphagia which was measured by Gugging swallowing screening test.
   - Patients and relatives who are all willing to participate in study.
2. **Exclusion criteria**
   - Patient who is unconscious and critically ill.
   - Patients with mandible and maxillary fracture.
   - Traumatic brain injury patients who are disoriented, in attentive with poor concentration.

DESCRIPTION OF THE TOOLS:

The tool used in this study consists of two parts

Part-1

Demographic data consists of age, gender, educational status, occupation, marital status, dysphagia (self-reported), conditions of oral cavity, types of feeding. (Annexure VI)

Part-2

Gugging swallowing screening tool was used to gather data. It consists of 4 levels.

Interpretation of scoring:

No dysphagia = 20

Slight dysphagia = 15-19

Moderate dysphagia = 10-14

Severe dysphagia = 0-9 (Annexure VI)

Part-3

Glasgow coma scale was used to gather data. It consists of

Severe, with Gcs = <8-9

Moderate, Gcs = 8 or 9-12

Minor, Gcs = ≥ 13 (Annexure VII)

DESCRIPTION OF THE INTERVENTION

Effortful swallow

1. Place the patient in comfortable position.
2. Swallow the saliva as hard as the person can.
3. Repeat for 5-10 times.
4. Continue for 3 times a day.(Annexure xviii)

Supra – glottis swallow:

1. Place the patient in comfortable position.

2. Take a deep breath with the food in the mouth.

3. Hold the breath and swallow.

4, Cough to clear any residues or food.

5, Perform the exercise without food.

6, Repeat for 5-10 times.

7, Continue for 3 times a day.(Annexure xviii)

Super supraglottic swallow maneuver:

1, Place the patient in comfortable position.

2, Take a deep breath without food in the mouth.

3, Hold the breath.

4, Bear down while swallowing saliva.

5, Cough to clear any residues of saliva.

6, Repeat this with food in the mouth. Repeat for 5-10 times.

7, Continue for 3 times a day.(Annexure xviii)

Content validity

Validity of the tool was established with the consultation of the guide and five experts with three M.Sc Nursing faculties with five years' experience, two Neurologists and one general Medical practitioner. The experts were requested to give their opinion and suggestion for further modification of items to improve the clarity and content of the items. The final tool was prepared as per the suggestions and advice given by the experts.(Annexure V)

Pilot study

Pilot study is a small scale version or trail done in preparation for a major study

A pilot study was conducted in Muthu Neuro Center, Chunkankadai. The researcher obtained initial permission from the Principal to conduct the pilot study then obtained permission from the director of Muthu Neuro Centre.

The pilot study was conducted among six of the moderate to slight swallowing difficult patients, among them three for study group and three for control group were selected by purposive sampling techniques. The pre assessment was done with Gugging swallowing screening scale and Glasgow coma scale. Swallowing exercise was taught for five days. Then the post test was conducted on the sixth day. Analysis of the data was done by using descriptive and inferential statistics. The tool and instrument were found feasible and practicable. No changes were made and researcher proceeded for the main study.

Reliability of the tool

Standardised tool of Gugging swallowing screening scale and Glosgow coma scale was used to assess swallowing and feeding performance. The reliability value was 0.83.

DATA COLLECTION FOR THE MAIN STUDY:

The researcher obtained formal approval from the Principal of St. Xavier's Catholic College of Nursing, Director in Muthu Neuro Centre, Chunkankadai and Kevin Neuro Centre, Vetunimadam. The researcher proceeded with the data collection after obtaining the oral consent.

Phase 1:

Purposive sampling technique was used to assess the effectiveness of swallowing exercise on swallowing and feeding performance. The data was collected with the selected participants and the Gugging swallowing screening standardized tool was used to assess the swallowing and feeding performance in study and control group. Oral consent had taken from each and every samples and the purpose and nature of the study was explained to them.

Phase 2:

In the study group pre assessment patient with traumatic brain injury taught about swallowing exercise with 3 kinds of effortful swallowing, supraglottic swallowing, super supraglottic swallowing for 6 days at the same time. The duration of the procedure was about 10 minutes. The patients with traumatic brain injury were made to practice the exercise daily in front of the researcher. . In control group, the samples were proceeded with routine care in the hospital.

Phase 3:

In study group the selected patients were assessed on the 6^{th} day of intervention and control group also the selected patient's were assessed on the 6^{th} day of intervention**.**

Data analysis

Descriptive statistics:

- Frequency and percentage distribution were used to analyse the demographic variables and to assess the level of swallowing and feeding performance.
- Mean and standard deviation were used to assess the effectiveness of swallowing exercise on level of swallowing and feeding performance among patients with traumatic brain injury.

Inferential statistics:

- paired't' test was used to compare the post assessment level of swallowing and feeding performance in study group and control group.
- Paired't' test was used to compare the pre assessment and post assessment level of swallowing and feeding performance among patients in study group.
- Chi-square test was used to find out the association of the post assessment level of swallowing and feeding performance in patients between the study group and control group with their selected demographic variables.

Protection of human rights

The proposed study was conducted after obtaining formal permission from the Principal and ethical committee of St. Xavier's Catholic College of Nursing and the directors of Muthu Neuro Centre, and Kevin Neuro Centre in Kanyakumari. The informed consent was obtained from the participants and the responses provided by them will be kept confidential. The participants were assured that no harm will be caused to them during the course of the study.

CHAPTER - IV

DATA ANALYSIS AND INTERPRETATION

Research data must be processed and analysed in an orderly fashion so that patterns and relationship can be discerned and validated, and hypotheses can be tested. Quantitative data analysed through statistical analysis includes simple procedures as well as complex and sophisticated methods.

This chapter deals with the analysis and interpretation of the data collected among traumatic brain injury patients with swallowing difficulty. The interpretation of tabulated data can bring to light the real meaning of the findings of the study. In order to find meaningful answers to the research questions the collected data must be processed and analysed in some orderly coherent fashion, so that patterns and relationships can be discerned. In this study the data was analysed based on the objectives and hypotheses of the study using descriptive and inferential statistics.

PRESENTATION OF DATA

This chapter is divided into five sections,

Section A:

1. Distribution of demographic variables and clinical variables of patients with traumatic brain injury in study group and control group.

1.1. Frequency and percentage distribution of demographic variables of patients with traumatic brain injury in study group and control group.

1.2 .Frequency and percentage distribution of clinical variables of patient with traumatic brain injury in study group and control group.

Section B:

2. Pre assessment on level of swallowing and feeding performance of patients with traumatic brain injury in study group and control group.

2.1. Pre assessment frequency and percentage distribution on preliminary swallowing test of patients with traumatic brain injury in study group and control group.

2.2. Pre assessment frequency and percentage distribution on direct swallowing test of patients with traumatic brain injury in study group and control group.

2.3. Distribution on pre assessment level of dysphagia of patients with traumatic brain injury in study group and control group.

Section C:

3. Post assessment on level of swallowing and feeding performance of patients with traumatic brain injury in study group and control group.

3.1. Post assessment frequency and percentage distribution on preliminary swallowing test of patients with traumatic brain injury in study group and control group.

3.2. Post assessment frequency and percentage distribution on direct swallowing test of patients with traumatic brain injury in study group and control group.

3.3. Distribution on post assessment level of dysphagia of patients with traumatic brain injury in study group and control group.

Section D:

4.1. Comparison of pre assessment and post assessment level of swallowing and feeding performance among patients with traumatic brain injury in study group and control group.

4.2. Comparison of post assessment level of swallowing and feeding performance among patients with traumatic brain injury in study group and control group.

Section E:

5. Association between the post assessment level of swallowing and feeding performance among patients with traumatic brain injury in study group and control group with demographic variables and clinical variables.

5.1. Association between post assessment level of swallowing and feeding performance of patients with selected demographic variables.

5.2. Association between post assessment level of swallowing and feeding performance of patients with the clinical variables.

SECTION: A

1. DISTRIBUTION OF DEMOGRAPHIC VARIABLES AND CLINICAL VARIABLES OF PATIENTS WITH TRAUMATIC BRAIN INJURY IN STUDY GROUP AND CONTROL GROUP

Table .1.1.Frequency and percentage distribution of demographic variables of patients with traumatic brain injury in study group and control group.

N=60

S.No	Demographic variables	Study group n=30		Control group n=30	
		f	%	f	%
1.	Age				
	a) 20 – 30 yrs.	12	40	11	36.66
	b) 31 – 40 yrs.	8	26.67	9	30
	c) 41 – 50 yrs.	4	13.33	5	16.67
	d) 51 and above	6	20	5	16.67
2,	Gender				
	a) Male	18	60	17	56.67
	b) female	12	40	13	43.33
3,	Educational status				
	a) Illiterate	0	0	0	0
	b) school education	8	26.67	10	33.33
	c) under graduate	14	46.67	13	43.33
	d) post graduate	8	26.66	7	23.34
4,	Occupation				
	a) unemployed	6	20	5	16.67
	b) self- employed	8	26.67	9	30
	c) government employee	6	20	7	23.33
	d) private employee	10	33.33	9	30
5,	Marital status				
	a) single	14	46.67	13	43.33
	b) married	16	53.33	17	56.67
	c) widow/widower	0	0	0	0
	d) separated	0	0	0	0

Table.1.1. with regard to the distribution of study group and control group of patients with traumatic brain injury, according to their age, in study group highest percentage 12(40%) of patients with traumatic brain injury were in the age group of 20-30 years,8(26.67%)of patients with traumatic brain injury were in the age group of 31-40

years, the lowest percentages 4(13.33%) of patients with traumatic brain injury were in the age group of 41-50 years,6(20%) of patients with traumatic brain injury were in the age group of 51 and above. In control group highest percentages 11(36.66%) of patients with traumatic brain injury were in the age group of 20-30 years,9(30%) of patients with traumatic brain injury were in the age group of 31-40 years,5(16.67%)of patients with traumatic brain injury were in the age group of 41-50 years,5(16.67%)of traumatic brain injury were in the age group of 51 and above. It depicts the highest percentage of patients with traumatic brain injury were in the age group of 20-30 years and 31-40 years.(fig.1.1)

With regard to the study and control group of patients with traumatic brain injury according to their gender reveals that, in study group the highest percentage 18(60%)of traumatic brain injury patients were male and the lowest percentage 12(40%)of traumatic brain injury patients were female. In control group the highest percentage 17(56.67%) of traumatic brain injury patients were male and the lowest percentage 13(43.33%) of traumatic brain injury were female. It depicts that the highest percentage of patients with traumatic brain injury were males.(fig.1.2)

With regard to the study group and control group patients with traumatic brain injury according to the education reveals that in study group the highest percentage 14(46.67%)of patients with traumatic brain injury had under graduate and the lowest percentage of 0(0%)of patients with traumatic brain injury were illiterate. In control group the highest percentage of 13(43.33%)of patients with traumatic brain injury were under graduate and the lowest percentage of 0(0%) of patients with traumatic brain injury were illiterate. It depicts that lower percentage of patients with traumatic brain injury were illiterate.(fig.1.3)

With regard to the study and control group of patients with traumatic brain injury according to the occupation reveals that in study group the highest percentage 10(33.33%)of patients with traumatic brain injury were private employee and the lowest percentage of 6(20%)of patients with traumatic brain injury were government employee and unemployed. In control group the highest percentage of 9(30%)of patients with traumatic brain injury were self-employed and private employee and the lowest

percentage of 5(16.67%) of patients with traumatic brain injury were unemployed. It depicts that lower percentage of patients with traumatic brain injury were private employee.(fig.1 .4)

With regard to the study and control group patients traumatic brain injury according to the marital status reveals that in study group the highest percentage 16(53.33)of patients with traumatic brain injury had married and the lowest percentage of 0(0%)of patients with traumatic brain injury were widow/widower and separated. In control group the highest percentage of 17(56.67%)of patients with traumatic brain injury were married and the lowest percentage of 0(0%) of patients with traumatic brain injury were widow/widower and separated. It depicts that highest percentage of patients with traumatic brain injury were married.(fig.1.5)

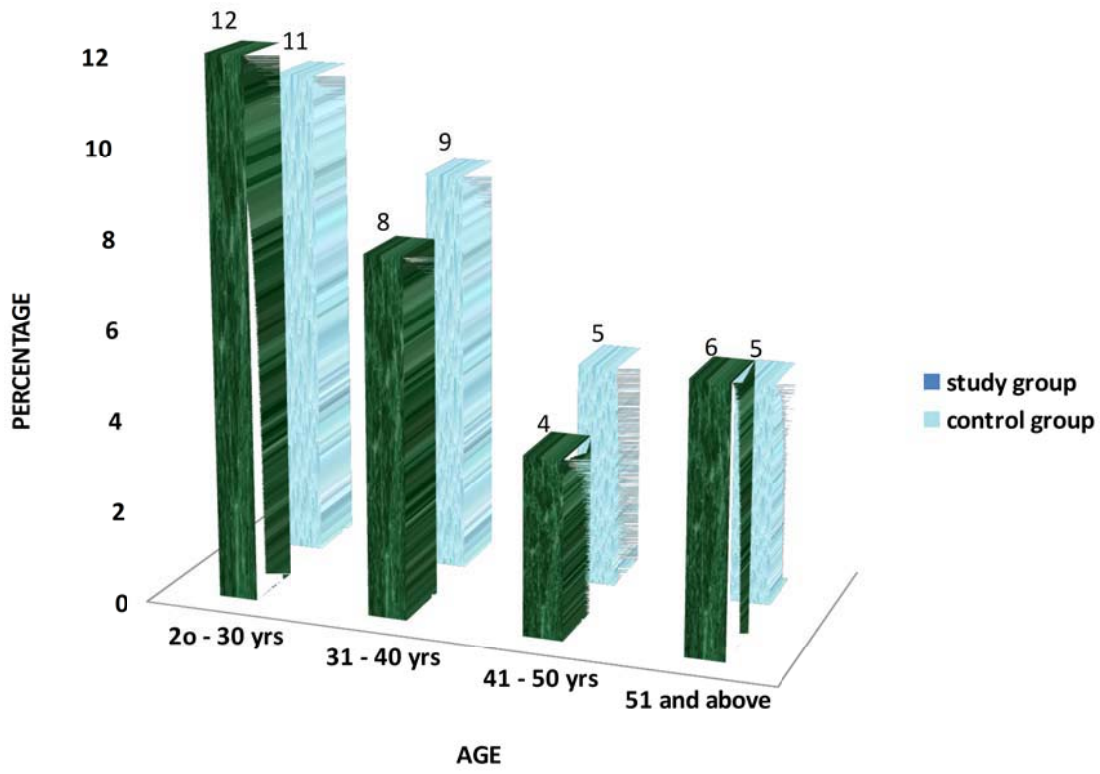

Figure .1.1. Percentage distribution of age among patients with traumatic brain injury.

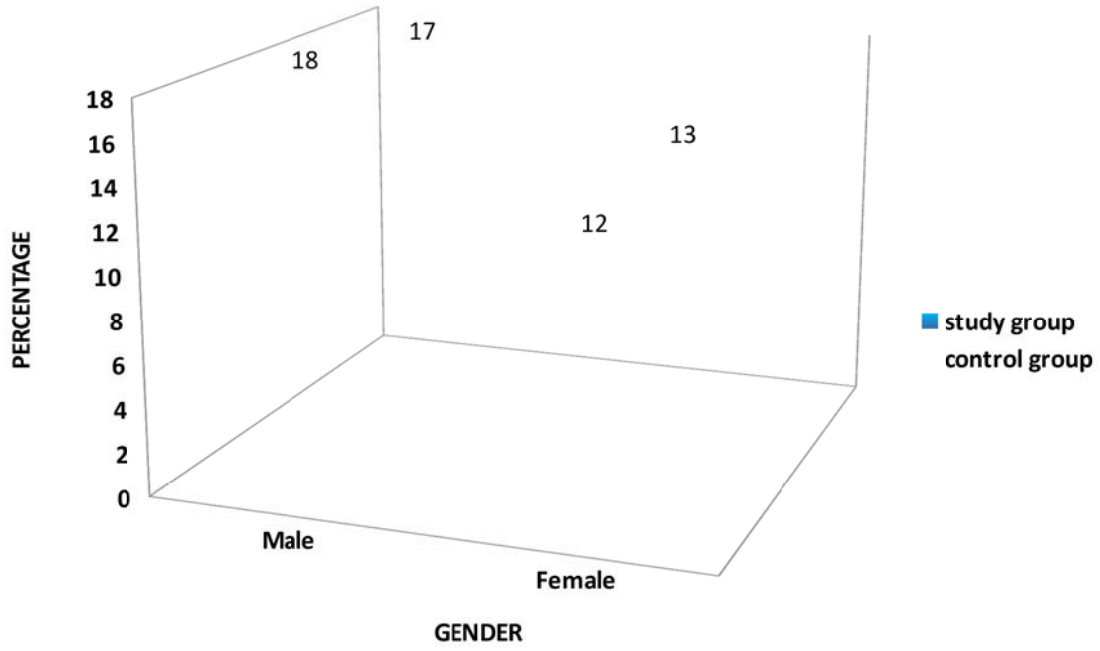

Figure .1.2. Percentage distribution of gender among patients with traumatic brain injury.

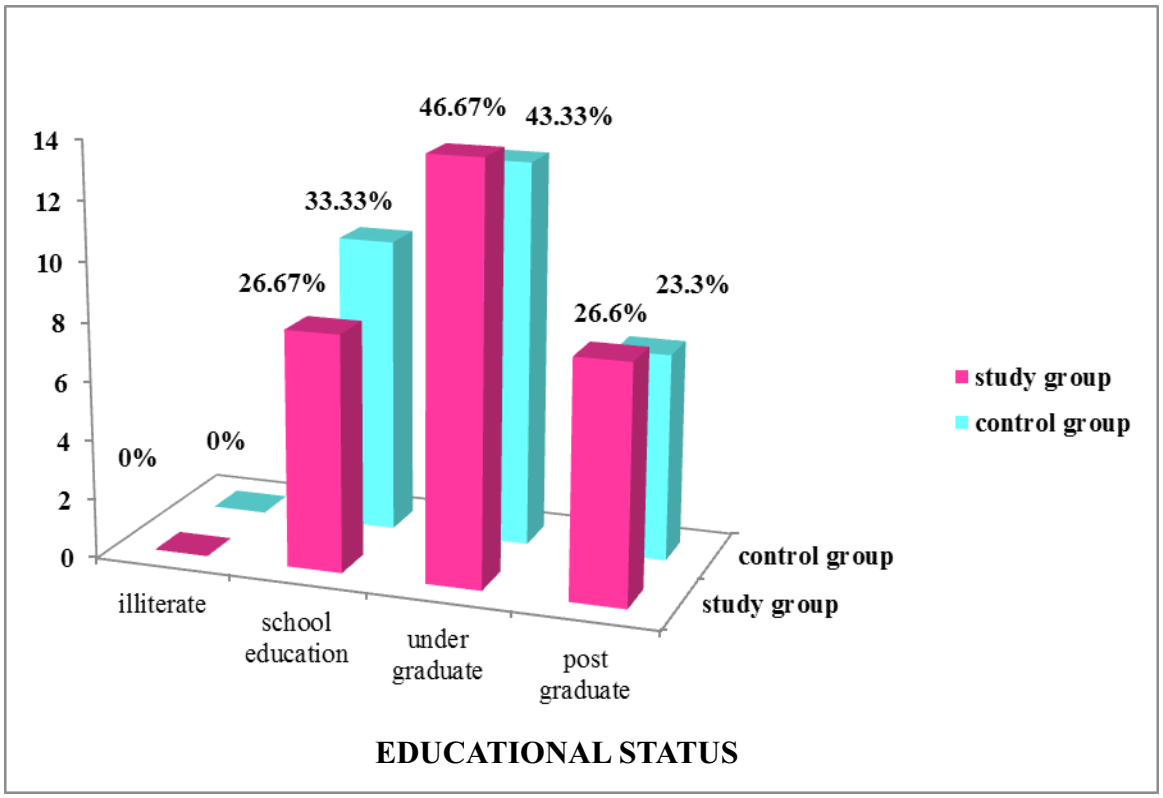

Figure .1.3. Percentage distribution of educational status among patients with traumatic brain injury.

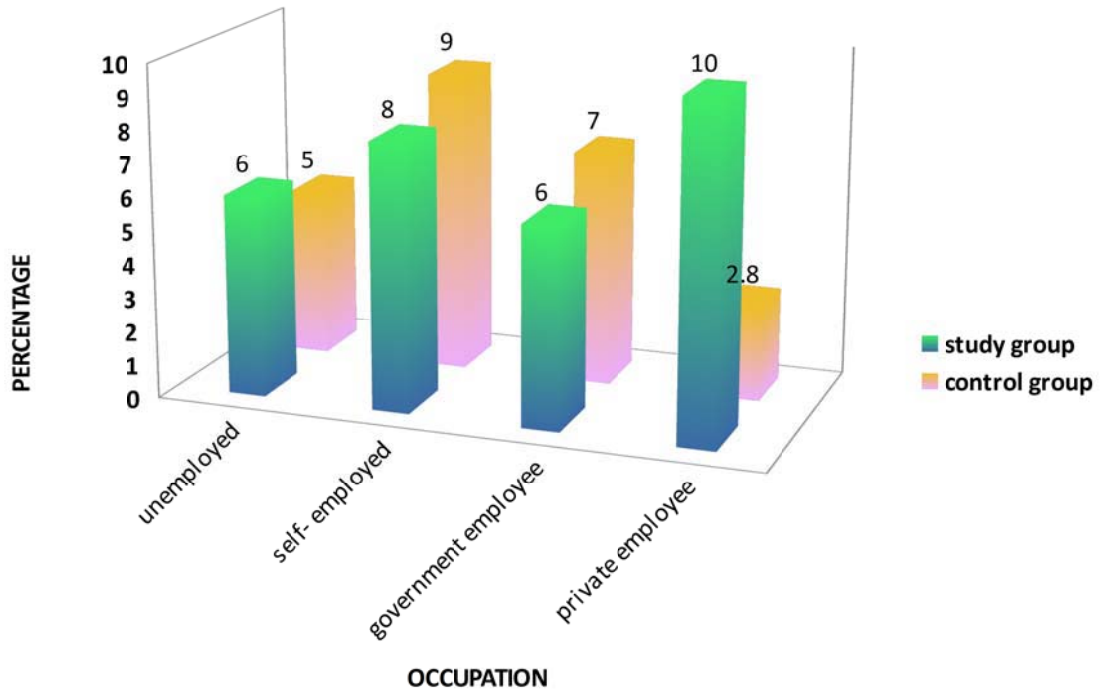

Figure .1.4. Percentage distribution of occupation among patients with traumatic brain injury.

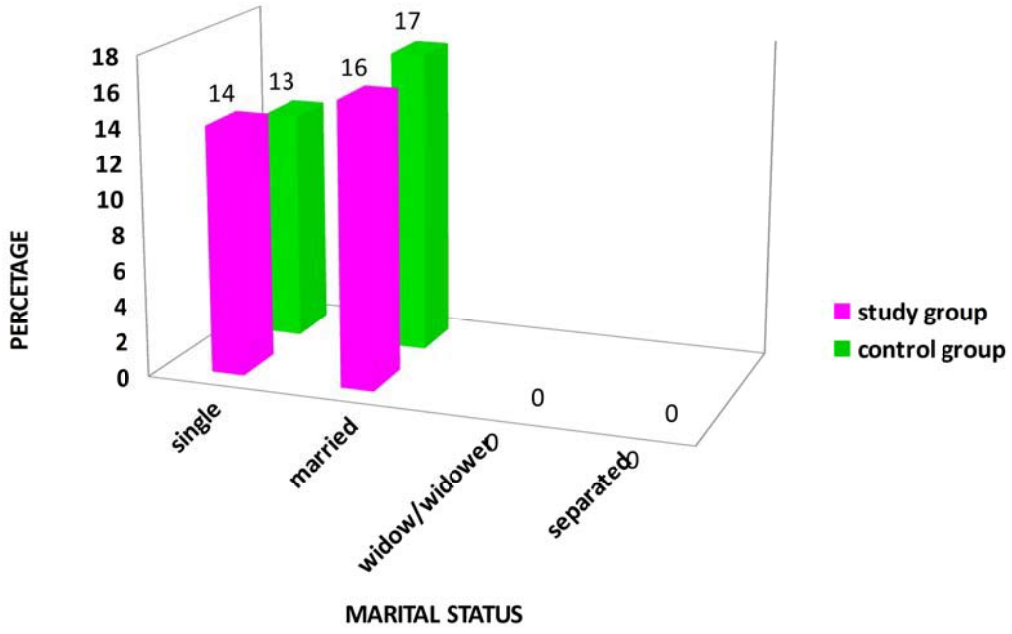

Figure .1.5. Percentage distribution of marital status among patients with traumatic brain injury.

Table.1.2.Frequency and percentage distribution of clinical variables of patient with traumatic brain injury in study group and control group .

N=60

S.No	Clinical variables	Study group n=30		Control groups n= 30	
		f	%	f	%
1,	Dysphagia (self reported) a) yes b) not sure	 12 18	 40 60	 13 17	 43.33 56.67
2,	Condition of oral cavity a) dry b) moist c) ulcerated d) coated	 30 0 0 0	 100 0 0 0	 30 0 0 0	 100 0 0 0
3,	Type of feeding a) partial b) non-oral c) oral	 10 20 0	 33.33 66.67 0	 11 19 0	 36.67 63.33 0

With regard to study and control group patients with traumatic brain injury on condition of the oral cavity reveals that in study group the highest percentage 30(100%)of patients with traumatic brain injury had dry oral cavity and the lowest

percentage of 0(0%)of patients with traumatic brain injury were moist, ulcerated, coated. In control group the highest percentage of 30(100%) of patients with traumatic brain injury were dry oral cavity and the lowest percentage of 00%) of patients with traumatic brain injury were moist, ulcerated, coated. It depicts that highest percentage of patients with traumatic brain injury were dry oral cavity (fig.1 .7)

With regard to study and control group of patients with traumatic brain injury on types of feeding reveals that in study group the highest percentage 20(66.67%)of patients with traumatic brain injury had non-oral and the lowest percentage of 10(33.33%)of patients with traumatic brain injury were partial. In control group the highest percentage of 19(63.33%) of patients with traumatic brain injury were non- oral and the lowest percentage of 11(36.67%) of patients with traumatic brain injury were partial. It depicts that highest percentage of patients with traumatic brain injury were non-oral (fig.1.8)

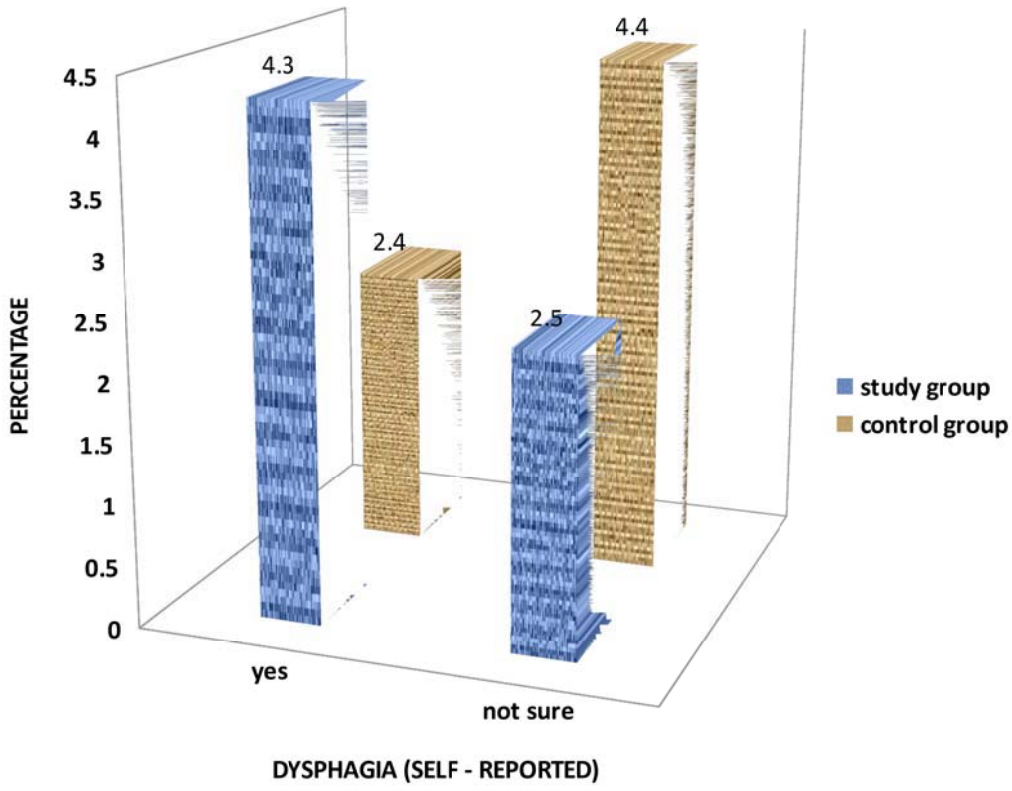

Figure .1.6. Percentage distribution of dysphagia (self-reported) among patients with traumatic brain injury.

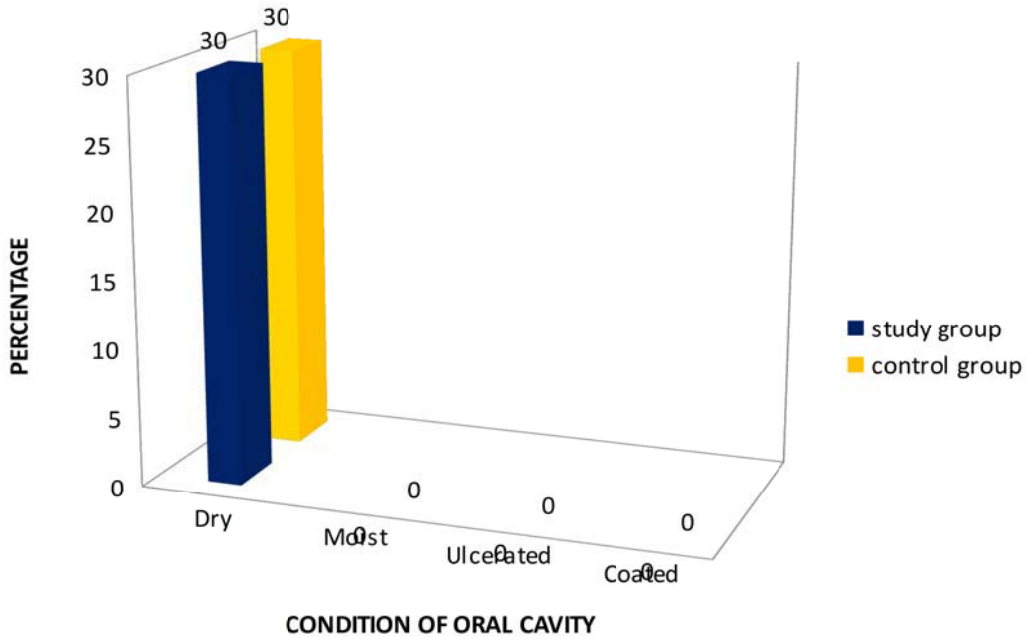

Figure .1.7. Percentage distribution of Condition of oral cavity among patients with traumatic brain injury.

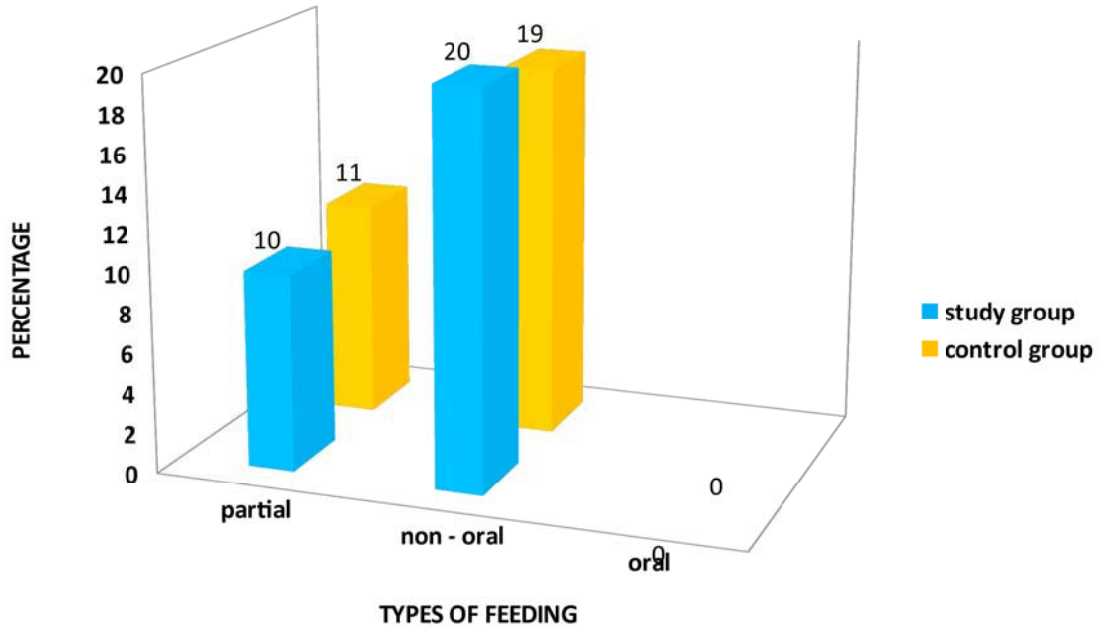

Figure .1.8. Percentage distribution of the types of feeding among patients with traumatic brain injury.

SECTION-B

1. PRE ASSESSMENT ON LEVEL OF SWALLOWING AND FEEDING PERFORMANCE OF PATIENTS WITH TRAUMATIC BRAIN INJURY IN STUDY GROUP AND CONTROL GROUP.

Table.2.1.Pre assessment frequency and percentage distribution on preliminary swallowing test of patients with traumatic brain injury in study group and control group.

N=60

S.No	Preliminary swallowing test	Study group n=30		Control group n=30	
		f	%	f	%
1.	vigilance	30	100	30	100
2.	Cough and/or throat clearing	30	100	30	100
3.	Saliva swallow				
	a) Swallowing successful	30	100	30	100
	b) Drooling	30	100	30	100
	c) Voice change	30	100	30	100

During pre-assessment of preliminary swallowing test in study group vigilance 30(100%) in control group 30(100%). Cough and/ or throat clearing in study group 30(100%) in control group 30(100%). Saliva swallowing test in the study group swallowing successful 30(100%),in control group swallowing successful 30(100%)in study group Drooling 30(100%),in control group 30(100%),in study group voice change 30(100%),in control group voice change 30(100%).

Table.2.2.1.pre assessment of frequency and percentage distribution of patients with traumatic brain injury by using direct swallowing test (semisolid food) in study group and control group.

N=60

S.No	Direct swallowing test(semisolid food)	Study group n=30		Control group n=30	
		f	%	f	%
1.	Deglutition a) Swallowing delayed b) Swallowing successful	 16 14	 53.3 46.7	 15 15	 50 50
2.	Cough a) Yes b) no	 3 27	 10 90	 3 27	 10 90
3.	Drooling a) yes b) no	 0 30	 0 100	 0 30	 0 100
4.	Voice change a) yes b) no	 2 28	 6.7 93.3	 3 27	 10 90

During pre-assessment of direct swallowing test(semi solid food) deglutition in this swallowing delayed 16(53.3%),swallowing successful 14(46.7%). In control group swallowing delayed 15(50%),swallowing successful 15(50%).cough in study group 3(10%)were reported yes ,27(90%)were reported no. in control group 3(10%) were reported yes, 27(90) were reported no, drooling In study group 0(0%) were reported yes, 30(100%)were reported no, voice change in study group 2(67%)were reported yes,28(93.3%) were reported no. In control group 3(10%) were reported yes, 27(90%)were reported no.

2.2.2. Pre assessment of frequency and percentage distribution of patients with traumatic brain injury by using direct swallowing test (liquid food) in study group and control group.

N=60

S.No	Direct swallowing test(liquid food)	Study group n=30		Control group n=30	
		f	%	f	%
1.	Deglutition				
	a, Swallowing delayed	16	53.3	15	50
	b, Swallowing successful	14	46.7	15	50
2.	Cough				
	a, Yes	1	3.3	3	10
	b, no	29	96.7	27	90
3.	Drooling				
	a, yes	0	0	0	0
	b, no	30	100	30	100
4.	Voice change				
	a, yes	1	3.3	1	3.3
	b, no	29	96.7	29	96.7

During pre-assessment of direct swallowing test (liquid food) In study group 16(53.3%)were swallowing delayed and swallowing successful 14(46.7%). In control group swallowing delayed 15(50%),swallowing successful 15(50%).cough in study group 1(3.3%) were reported yes,29(96.7%)were reported no. in control group 3(10%)were reported yes,27(90)were reported no, drooling in study group 0(0%)were reported yes,30(100%)were reported no. in control group0(0%)were reported yes,30(100%)were reported no, voice change in study group 1(3.3%)were reported yes,29(96.7%)were reported no. Control group1(3.3%)were reported yes,2(96.7%)were reported no.

Table.2.3. Distribution on pre assessment level of dysphagia of patients with traumatic brain injury in study group and control group.

N=60

S.No	Level of dysphagia(pre assessment)	Study group n=30		Control group n=30	
		f	%	f	%
2.	Slight dysphagia	14	46.67	15	50
3.	Moderate dysphagia	16	53.33	15	50

During pre-assessment, in study group 16(53.33%) had moderate level of dysphagia, 14(46.67%) had slight dysphagia and no one had severe and no dysphagia.in control group 15(50%) had moderate level of dysphagia, 15(50%) had slight dysphagia and no one had severe and no dysphagia.

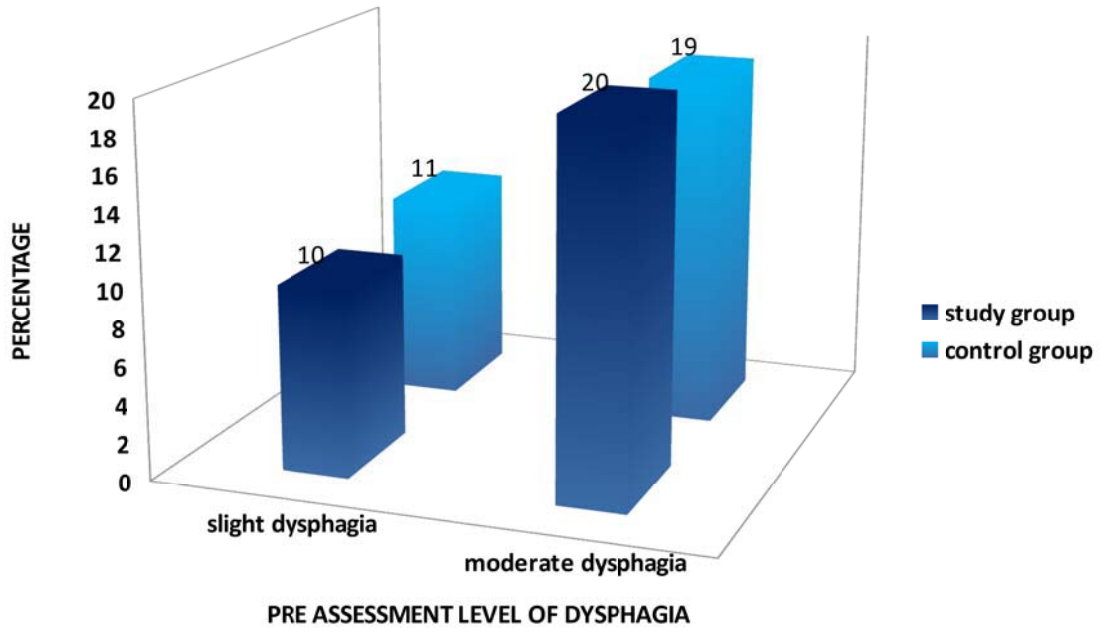

Figure .2.3.Distribution on pre assessment level of dysphagia of patients with traumatic brain injury in study group and control group.

SECTION: C

3. POST ASSESSMENT ON LEVEL OF SWALLOWING AND FEEDING PERFORMANCE OF PATIENTS WITH TRAUMATIC BRAIN INJURY IN STUDY GROUP AND CONTROL GROUP.

Table.3.1. Post assessment of Frequency and percentage distribution on preliminary swallowing test of patients with traumatic brain injury in study group and control group.

N=60

S.No	Preliminary swallowing test	Study group n=30		Control group n=30	
		f	%	f	%
1.	vigilance	30	100	30	100
2.	Cough and/or throat clearing	30	100	30	100
3.	Saliva swallow				
	a) Swallowing successful	30	100	30	100
	b) Drooling	30	100	30	100
	c) Voice change	30	100	30	100

During post assessment of preliminary swallowing test in study group vigilance 30(100%) in control group 30(100%). Cough and/ or throat clearing in study group 30(100%) in control group 30(100%). Saliva swallow in this, in study group swallowing successful 30(100%). Drooling 30(100%),voice change 30(100%). In control group saliva swallow, in this swallowing successful 30(100%),drooling 30(100%) voice change 30 (100%).

Table.3.2.1. Post assessment of frequency and percentage distribution of patients with traumatic brain injury by using direct swallowing test(semisolid food) in study group and control group.

N= 60

S.No	Direct swallowing test(semisolid food)	Study group n=30		Control group n=30	
		f	%	f	%
1.	Deglutition				
	a) Swallowing delayed	12	40	20	66.7
	b) Swallowing successful	18	60	10	33.3
2.	Cough				
	a) Yes	3	10	6	20
	b) no	27	90	24	80
3.	Drooling				
	a) yes	0	0	0	0
	b) no	30	100	30	100
4.	Voice change				
	a) yes	0	0	7	23.3
	b) no	30	100	23	76.7

During post assessment of direct swallowing test (semisolid food) deglutition in the study group swallowing delayed 12(40%), swallowing successful 18(60%). In control group swallowing delayed 20(66.7%),swallowing successful 10(33.3%).cough in study group 3(10%)were reported yes,27(90%)were reported no, in control group

6(20%)were reported yes,24(80%)were reported no, drooling in study group 0(0%)were reported yes,30(100%)were reported no. in control group 0(0%)were reported yes,30(100%)were reported no, voice change in study group 0(0%)were reported yes,30(100%)were reported no. control group 7(23.3%)were reported yes, 23(76.7%)were reported no.

Table.3.2.2.post assessment of frequency and percentage distribution of patients with traumatic brain injury by using direct swallowing test (liquid food) in study group and control group.

N=60

S.No	Direct swallowing test(liquid food)	Study group n=30		Control group n=30	
		f	%	f	%
1.	Deglutition a) Swallowing delayed b) Swallowing successful	12 18	40 60	20 10	66.7 33.3
2.	Cough a) Yes b) no	0 30	0 100	5 25	16.7 83.3
3.	Drooling a) yes b) no	0 30	0 100	0 30	0 100
4.	Voice change a) yes b) no	2 28	6.7 93.3	7 23	23.3 76.7

During post assessment of direct swallowing test (liquid food) deglutition in this swallowing delayed 12(40%),swallowing successful 18(60%). In control group swallowing delayed 20(66.7%),swallowing successful 10(33.3%).cough in study group 3(10%)were reported yes,30(100%)were reported no. in control group 5(16.7%)were reported yes, 25(83.3%)were reported no, drooling in study group 0(0%)were reported

yes ,30(100%)were reported no. in control group 0(0%)were reported yes,30(100%)were reported no, voice change in study group 2(6.7%)were reported yes,28(3.3%)were reported no. control group 7(23.3%)were reported yes,23(76.7%)were reported no.

Table.3.2.3. post assessment of frequency and percentage distribution of patients with traumatic brain injury by using direct swallowing test (solid food) in study group and control group.

N=60

S.No	Direct swallowing test(solid food)	Study group n=30		Control group n=30	
		f	%	f	%
1.	Deglutition				
	a) Swallowing delayed	12	40	20	66.7
	b) Swallowing successful	18	60	10	33.3
2.	Cough				
	a) Yes	1	3.3	4	13.3
	b) no	29	96.7	26	86.7
3.	Drooling				
	a) yes	0	0	0	0
	b) no	30	100	30	100
4.	Voice change				
	a) yes	0	0	6	20
	b) no	30	100	24	80

During post assessment of direct swallowing test (solid food) deglutition in this swallowing delayed 12(40%), swallowing successful 18(60%). In control group swallowing delayed 20(66.7%), swallowing successful 10(33.3%).cough in study group 1(3.3%) were reported yes, 2(6.7%)were reported no. In control group 4(13.3%)were reported yes,26(86.7%)were reported no, drooling in study group 0(0%)were reported

yes,30(100%) were reported no.in control group 0(0%)were reported yes,30(100%)were reported no, voice change in study group 0(0%)were reported yes,30(100%)were reported no. In control group 6(20%) were reported yes, 24(80%) were reported no.

Table.3.3.DISTRIBUTION ON POSTASSESSMENT LEVEL OF DYSPHAGIA OF PATIENTS WITH TRAUMATIC BRAIN INJURY IN STUDY GROUP AND CONTROL GROUP.

N=60

S.No	Level of dysphagia	Study group n=30		Control group n=30	
		f	%	f	%
1.	No dysphagia	18	60	10	33.33
2.	Slight dysphagia	12	40	14	46.67
3.	Moderate dysphagia	0	0	6	20

During post-test, in study group 18(60%) had no dysphagia, 12(40%) had slight dysphagia. In control group 14(46.67%) had slight dysphagia, 10(33.33%) had no dysphagia, 6(20%) had moderate dysphagia.

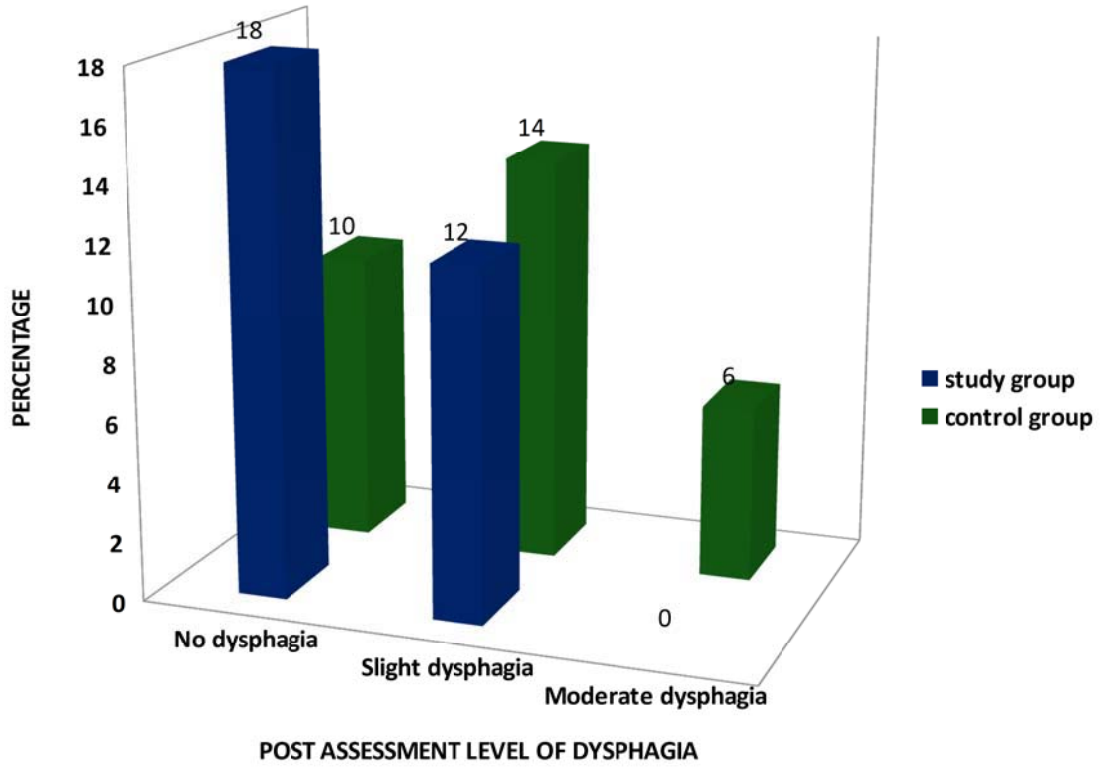

Figure .3.3.Distribution on post assessment level of dysphagia of patients with traumatic brain injury in study group and

SECTION-D

4..COMPARISON OF PRE ASSESSMENT AND POST ASSESSMENT LEVEL OF SWALLOWING AND FEEDING PERFORMANCE AMONG PATIENTS WITH TRAUMATIC BRAIN INJURY IN STUDY GROUP AND CONTROL GROUP.

4.1 Comparison of pre assessment and post assessment level of swallowing and feeding performance among study group and control group.

N=60

S.No	**Group**	**Mean**	**SD**	**Mean difference**	**df**	**‘ t ’ test value**	**P <**
1.	Study group (n=30) Pre assessment Post assessment	13.33 18.21	2.61 1.93	4.88	29	7.18	
2.	Control group (n=30) Pre assessment Post assessment	13.66 16.52	2.71 1.83	2.86	29	4.21	

Table-4.1.Represents, the mean score on level of swallowing and feeding performance among patients in study group was 13.33 in pre-test and 18.21 in post-test. The paired ‘t’ value was 7.18* which is significant at $p<0.05$.It shows that swallowing exercise was effective in improving the level of swallowing and feeding performance. Hence the research hypothesis (H_1) is accepted.

In control group the mean score on level of swallowing and feeding performance was 13.66 in pre-test and 16.52 in post-test. The estimated paired‘t’ value was 4.21 which is significant at $p<0.05$.

Table.4.2. COMPARISON OF POST ASSESSMENT LEVEL OF SWALLOWING AND FEEDING PERFORMANCEAMONG PATIENTS WITH TRAUMATIC BRAIN INJURY IN STUDY GROUP AND CONTROL GROUP.

N=60

S.No	Group	Mean	Standard deviation	't' value
1.	Study group	18.21	1.93	3.60*
2.	Control group	16.52	1.83	

P <0.05 level of significance

Table–4.2.Represents, the mean score on level of swallowing and feeding performance among patients in study group was 18.21 in post-test and 16.52 in control group post-test. The estimated't' value was 3.60* which is significant at p <0.05, it shows that swallowing exercise was effective in improving the level of swallowing and feeding performance. Hence the research hypothesis (H_2) is accepted

SECTION –E

5. ASSOCIATION BETWEEN THE POST ASSESSMENT LEVEL OF SWALLOWING AND FEEDING PERFORMANCE IN STUDY GROUP AND CONTROL GROUP WITH THE DEMOGRAPHIC VARIABLES AND CLINICAL VARIABLES.

Table.5.1. Association between post assessment level of swallowing and feeding performance of patients with selected demographic variables in study group and control group.

N=30

S.No	Demographic variables	No dysphagia		Slight dysphagia		Moderate dysphagia		Chi-square test
		f	%	f	%	f	%	χ^2
1.	Age	18	60	12	40	0	0	$\chi^{2=}$0.56 df=3 t=7.82
2.	Gender	12	40	18	60	0	0	χ^2=5.93 df=1 t=3.84
3.	Educational status	16	53.3	14	46.7	0	0	χ^2=0.53 df=2 t=5.99
4.	Occupation	15	50	15	50	0	0	$\chi^{2=}$0.63 df=3 t=7.82
5.	Marital status	16	53.3	14	46.7	0	0	$\chi^{2=}$0.20 df=1 t=3.84

In study group on considering the age, the chi-square value was 0.56, and the table value at degrees of freedom 3 was 7.82.as per their gender, the chi-square value

was 5.93, at degrees of freedom 1 was 3.84. On considering educational status, the chi-square value was 0.53, at degree of freedom 2 the table value was 5.99. As per occupation, the chi-square value was 0.63, at degrees of freedom 3 the table value 7.82.on considering the marital status the chi-square value was 0.201, at degrees of freedom 1 the table value was 3.84.

Table.5.1.1. Association between post assessment level of swallowing and feeding performance of patients with selected demographic variables in control group.

N = 30

S.No	Demographic variables	No dysphagia		Slight dysphagia		Moderate dysphagia		Chi-square test
		f	%	f	%	f	%	χ^2
1.	Age	12	40	14	46.7	4	13.33	$\chi^{2=}$5.33 df=6 t=12.5
2.	Gender	13	43.33	12	40	5	16.7	$\chi^{2=}$3.88 df=2 t=5.99
3.	Educational status	10	33.33	12	40	8	26.77	$\chi^{2=}$5.33 df=4 t=9.49
4.	Occupation	11	36.7	17	56.7	2	6.7	$\chi^{2=}$3.16 df=6 t=12.59
5.	Marital status	12	40	13	43.33	5	16.7	$\chi^{2=}$8.50 df=2 t=5.99

In control group on considering the age, the chi-square value was 5.33, and the table value at degrees of freedom 6 was 12.59. As per their gender, the chi-square value was 3.88, at degrees of freedom 2 was 5.99. On considering educational status, the chi-square value was 5.33, at degree of freedom 4 the table value was. As per occupation, the chi-square value was 3.16, at degrees of freedom 6 the table value 12.59.on considering the marital status, the chi-square value was 8.50, at degrees of freedom 2 the table value was 5.99.

Table.5.2.Association between post assessment level of swallowing and feeding performance of patients with traumatic brain injury in the clinical variables in study group and control group.

N = 30

S.No	Clinical variables	No dysphagia	Slight dysphagia	Moderate dysphagia	Chi-square test
					χ^2

		f	%	f	%	f	%	
1.	Dysphagia	12	40	18	60	0	0	$\chi^{2=}$5.92 df=1 t=3.84
2.	Condition of the oral cavity	16	53.3	14	46.7	0	0	χ^{2}=0 df=0 t=0
3.	Types of feeding	15	50	15	50	0	0	$\chi^{2=}$2.5 df=1 t=3.84

on considering clinical variables in study group dysphagia (self-reported) the chi-square value was 5.92, at degrees of freedom 1 the table value was 3.84.on considering the types of feeding the chi-square value was 2.5,at degrees of freedom 1 the table value was 3.84.since the chi- square value was lower than the table value there was no association between the levels of swallowing and feeding performance with the selected demographic variables.

Table.5.2.2.Association between post assessment level of swallowing and feeding performance of patients with traumatic brain injury in the clinical variables in control group.

N=30

S.No	**Clinical variables**	**No dysphagia**		**Slight dysphagia**		**Moderate dysphagia**		**Chi-square test**
								χ^{2}
		f	**%**	**f**	**%**	**f**	**%**	
1.	Dysphagia			14	46.7	2	6.7	$\chi^{2=}$3.59

		14	46.7					df=2 t=5.99
2.	Condition of the oral cavity	16	53.3	12	40	2	6.7	$\chi^{2=}0$ df=0 t=0
3.	Types of feeding	13	43.3	13	43.3	4	13.3	$\chi^{2=}12.92$ df=2 t=5.99

on considering the clinical variables in control group dysphagia(self-reported) the chi-square value was 3.59,at degrees of freedom 2 the table value was 5.99.on considering the types of feeding the chi-square value was 12.92,at degrees of freedom 2 the table value was 5.99.since the chi- square value was higher than the table value there was the association between the levels swallowing and feeding performance with the selected demographic variables.

CHAPTER - V

DISCUSSION

This chapter deals with the discussion of the data analysed based on the objectives and hypothesis of the study. The problem stated was conducted to assess the effectiveness of swallowing exercise on swallowing and feeding performance among patients with traumatic brain injury in selected hospital at Kanyakumari district. The discussion was based on the objectives of the study and the hypotheses mentioned in the study.

Distribution of samples according to their demographic variables

Majority of the samples in the demographic variables of the study group ,12(40%) of them belong to 20-30 years,18(60%) of them were male, 14(46.67%) of them were

under graduate, 10(33.33%) of them were private employee,16(53.33%) of them were married,18(60%) of them were not self-reported as dysphagia,30(100%) of them had dry oral cavity,20(66.67%) of them were taking non- oral feeding.

Were as control group ,11(.36.66%) of them belongs to 20-30 years,18(60%) of them were male, 13(43.33%) of them were under graduate, 9(30.00%) of them were private employee and self- employed ,17(56.67%) of them were married,17(56.67%) of them were not self-reported as dysphagia,30(100%) of them had dry oral cavity,19(63.33%) of them were taking non- oral feeding

Majority of the samples in the demographic profile of the study group ,8(26.64%) of them belongs to 31 – 40 years,12(40%) of them were female, 8(26.67%) of them had school education and post graduate, 8(26.67%) of them were self-employed , 14(46.67%) of them were single,12(40%) of them were self-reported as dysphagia,30(100%) of them had dry oral cavity,10(33.33%) of them were taking non-oral feeding.

Were as in control group,9(30.00%) of them belongs to 31 – 40 years,13(43.33%) of them were female, 10(33.33%) of them had school education , 7(23.33%) of them were government employee ,13(43.33%) of them were single,13(43.33%) of them were self-reported as dysphagia,30(100%) of them had dry oral cavity,11(36.67%) of them were taking partial feeding.

The first objectives is to find out the pre assessment and level of swallowing and feeding performance among patients with traumatic brain injury in study group and control group

During pre-assessment, in study group 16(53.33%) had moderate level of dysphagia, 14(46.67%) had slight dysphagia and no one had severe and no dysphagia.in control group 15(50%) had moderate level of dysphagia,15(50%)had slight dysphagia and no one had severe and no dysphagia

During post assessment, in study group 18(60%) had no dysphagia, 12(40.00%) had slight dysphagia. In control group 14(46.67%) had slight dysphagia,10(33.33%)had no dysphagia,6(20%) had moderate dysphagia.

This study is supported with **Bernice Ann,Mathisen**(2010) conducted a prospective cohort intervention study by using tongue –strengthening exercise programs in dysphagia intervention .A total of 60 patients in two groups by using random sampling .the result showed that tongue -strengthening exercise has the potential to be a simple yet effective therapeutic tool to add to the options for swallowing rehabilitation in adults.

Ludwig von General system theory based on the first step was assessed the swallowing and feeding performance among patients with traumatic brain injury. Here the investigator compared with the pre and post assessment level of swallowing and feeding performance among patients in study group and control group.

The second objectives is to compare the post assessment level of swallowing and feeding performance among patients with traumatic brain injury between study group and control group.

The mean score on level of swallowing and feeding performance among patients in study group was 18.21 in post assessment and 16.52 in control group post assessment. The estimated't' value was 3.60* which is significant at $p < 0.05$,it shows that swallowing exercise was effective in improving in the level of swallowing and feeding performance. Hence the research hypothesis (H_2) is accepted.

In the study group the post assessment mean score was 18.21+- 1.93 and in the control group was 16.52+_1.83. The mean difference was high and statistically significant. That is study group was better than the control group. This is due to the swallowing exercise. Hence the swallowing exercise was effective to increase the swallowing and feeding among patients with traumatic brain injury.

This study is supported with **John ashford,Danielmccabe**.(2009) conducted a case control design study in oropharyngeal dysphagia behavioural treatment. A total of

820 patients from this dementia 43%,CVA 6%,cerebral ataxia 3%, head injury 1% by using the purposive sampling techniques. The result is swallowing maneuivers prevent the risk of aspiration.

Based on the general system theory the second step was regular practice of swallowing exercises. In the study group has significant changes in swallowing and feeding performance. Then the pre assessment and post assessment level of swallowing and feeding performance among patients with traumatic brain injury in study group and control groups compared. Based on calculation study group shows better changes in the level of swallowing and feeding performance than control group.

The third objectives is to association between the post assessment level of swallowing and feeding performance among patients in study group and control group with their selected demographic variables

There is no association between post-test level of swallowing and feeding performance among patients with their selected demographic variables in study and control group.

In the study group, there is no significant association in the level of swallowing and feeding performance ($p<0.05$) with none of the selected demographic variables. There is so association in the level of swallowing and feeding performance with age, gender, educational status, occupation, marital status and clinical variables such as dysphagia (self-reported), condition of the oral cavity, types of feeding.

In the control group, there is no significant association in the level of swallowing and feeding performance with none of the selected demographic variables. There is significant association in the level of swallowing and feeding performance with clinical variables in control group such as dysphagia (self-reported), condition of the oral cavity, and types of feeding. Therefore, H3 is accepted

CHAPTER - VI

SUMMARY, CONCLUSION, NURSING IMPLICATIONS, LIMITATIONS, RECOMMENDATIONS

This chapter deals with the summary of the study, conclusion drawn, nursing implications, limitations and recommendations of the study.

Summary

Quantitative approach with quasi experimental study pre-test, post-test control group design was used to determine the effectiveness of swallow exercise on level of swallowing and feeding performance among patients who are with traumatic brain injury. The conceptual framework was based on Ludwig von general system theory. The tool used in the study consisted of two parts. Part one was demographic variables and the part two was Gugging swallowing screening scale. Purposive sampling technique was used to collect the sample and the data was collected from the study participant in study and control group, the data were collected and analysed using descriptive and inferential statistics. The level of significance was assessed by $p<0.05$ level of significance to test the hypotheses.

The major findings

The demographic variables in study group and control group patients with traumatic brain injury were, according to the age in study group 12(40%) patients with traumatic brain injury were in the age group of 20-30 years,8(26.67%) patients with traumatic brain injury were in the age group of 31-40 years, 4(13.33%) patients with traumatic brain injury were in the age group of 41-50 years,6(20%) patients with traumatic brain injury were in the age group of 51 and above. In control group 11(36.66%) patients with traumatic brain injury were in the age group of 20-30 years,9(30%) patients with traumatic brain injury were in the age group of 31-40 years,5(16.67%) patients with traumatic brain injury were in the age group of 41-50 years,5(16.67%) traumatic brain injury were in the age group of 51 and above.

In the study and control group patients with traumatic brain injury according to their gender reveals that, in study group the highest percentage 18(60%)of traumatic brain injury patients were male and 12(40%)of traumatic brain injury patients were female. In control group 17(56.67%) of traumatic brain injury patients were male and 13(43.33%)of traumatic brain injury were female.

According to the education reveals that in study group 14(46.67%)of patients with traumatic brain injury had under graduate education and none of (0.00%)were

illiterate. In control group 13(43.33%)of patients with traumatic brain injury were under graduate and none (0.00%) of were illiterate.

In regard to the occupational status reveals that in study group 10(33.33%)of patients with traumatic brain injury are private employee and of 6(20%)of patients with traumatic brain injury were government employee and unemployed. In control group 9(30%)of patients with traumatic brain injury were self-employed and private employee and 5(16.67%) of patients with traumatic brain injury were unemployed.

Concurrence to the marital status in study group 16(53.33)of patients with traumatic brain injury are married and (0.00%)none were widow/widower and separated. In control group 17(56.67%)of patients with traumatic brain injury were married and the (0.00%) none were widow/widower and separated.

With respect to swallowing difficulty according to the self-report study group 18(60%)of patients with traumatic brain injury had no swallowing difficulty and 12(40%)of patients traumatic brain injury were self-reported of swallowing difficulty . In control group the highest percentage of (56.67%)of patients with traumatic brain injury did not self-reported swallowing difficulty and 13(43.33%) of patients with traumatic brain injury were self-reported swallowing difficulty.

According to the on condition of the oral cavity in study group 30(100%)of patients with traumatic brain injury had dry oral cavity and none0(0%)of patients with traumatic brain injury had moist, ulcerated, coated oral cavity. In control group 30(100%)of patients with traumatic brain injury had dry oral cavity and none 0(0%) of patients with traumatic brain injury had moist, ulcerated, coated oral cavity.

Representing on the types of feeding study group, the 20(66.67%)of patients with traumatic brain injury had non-oral and 10(33.33%)of patients with traumatic brain injury had partial feeding. In control group 19(63.33%)of patients with traumatic brain injury had non- oral and 11(36.67%) of patients with traumatic brain injury had partial feeding .

Conclusion

Quasi experimental, pre assessment and post assessment control group design was adopted. Samples were selected from Muthu Neuro Centre, Chunkankadai, Kanyakumari District,Kevin Neuro Centre, Vettunimadam, Kanyakumari District.. By using purposive sampling technique 60 samples were selected, 30 samples were in study group, 30 samples were in control group. Gugging swallowing screening scale was used to assess the level of dysphagia .For study group the investigator demonstrated swallowing exercise for 10 minutes three times a day in 5 days. For control group the hospital routine was followed. Post assessment was conducted on 6 day of the intervention. The data gathered were analyzed by descriptive and inferential statistics and interpretation were made on the basis of the objectives of the study.

During pre-assessment, in study group 14(46.67%) had slight dysphagia, 16(53.33%) had moderate dysphagia, and none of them had no dysphagia and severe dysphagia. In control group 15(50%) had slight dysphagia, 15(50%) had moderate dysphagia and none of them had no dysphagia and severe dysphagia. During post assessment in study group 18(60%) had no dysphagia, 12(40%) had slight dysphagia, and none of them had moderate dysphagia and severe dysphagia. In control group 10(33.33%) had no dysphagia, 14(46.67%) had slight dysphagia, 6(20%) had moderate dysphagia and none of them had severe dysphagia.

In study group the mean score of was 13.33 in pre assessment and 18.21 in post assessment. The estimated paired t test value was 7.18 which is significant at $p<0.05$. In control group, the mean score was 13.66 in pre assessments and 16.52 in post assessment. The estimated paired t test value was 4.21 which is not significant at $p<0.05$. It shows that swallowing exercise are effective to improve the swallowing and feeding performance. In study group the mean post assessment score of swallowing and feeding performance was 18.21. In control group the post assessment score of swallowing and feeding performance was 16.52.The unpaired t test value was 3.60, which is significant at $p<0.05$ level of significance.

There is no significant association between the post assessment level of swallowing and feeding performance among traumatic brain injury patients in study group and control group with selected demographic variables such as age, gender,

education, occupation, marital status, clinical variables such as condition of oral cavity, dysphagia(self-reported),types of feeding at $p<0.05$ level. Hence hypothesis is H_2 is not accepted. As per the study the researcher concludes that the swallowing exercise has effect on swallowing and feeding performance and improves it.

Nursing Implications

The researcher has derived the following implications from the study results, which are of vital concern to the field of nursing service, nursing administration, nursing education and nursing research.

Nursing service

- Nursing personnel should develop in-depth knowledge about how to give swallowing exercise for swallowing difficulty patients.
- Nurses should be knowledgeable regarding the benefits of swallowing exercise.

Nursing education

- Nurse educators should be equipped with knowledge regarding the steps of swallowing exercise and techniques.
- Strengthen the curriculum of nurses to extend their knowledge and skills in various modalities of therapies.

Nursing administration

- Nurse administrators should be able to make judgments as to which intervention helps in reducing dysphagia.
- Public information programmes should be designed by nurses to encourage exercises among swallowing difficulty patients

Nursing research

- Nursing research is to be done to find out the various level of exercise to reduce dysphagia.
- Large scale study should be conducted on assessing the swallowing and the feeding performance.

Limitations

Since there were minimal studies related to swallowing exercise for traumatic brain injury patients researcher found it difficulties in collecting study materials for review**.**

Recommendations

- A study can be conducted on large samples may help to draw conclusions that are more definite and generalize to a larger population.
- A comparative study could be conducted to evaluate the effectiveness of swallowing exercise versus other non- pharmacological measures.

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ANNEXURE I

St. XAVIER'S CATHOLIC COLLEGE OF NURSING

Chunkankadai, Nagercoil,
Kanyakumari District,
Tamil Nadu - 629 003.

Tel : College : 04651 - 231740
Cell : 9840307884
Fax : 04651 - 230914
E-mail : xaviers_nursing@yahoo.com
reenaevancy@yahoo.com
Website : www.xaviersnsg.edu.in

Dr. A. REENA EVENCY, M.Sc. (N)., Ph.D.,
Principal

29/06/2015

To

Dr.Joseph,

Kevin Neuro Hospital,

Nagercoil.

Respected Madam,

Ms. Jasline shiny is a student of M.Sc. Nursing program in our college from Medical and Surgical Nursing Department. She is conducting study on" An experimental study to evaluate the effectiveness of swallowing exersice on swallowing and feeding performance among patients with head injury in selected hospital, kanyakumari District."

This is for the research project to be submitted to the Dr. M.G.R.Medical University in partial fulfillment of university requirement for the award of M.Sc. Nursing degree and will be beneficial in understanding and improving the health of the patients on swallowing and feeding performance with head injury .

As a part of her study she needs to observe the improvement the patients on swallowing and feeding performance with head injury in your hospital. So permission may kindly be granted to her to conduct the study in your esteemed hospital. She will abide by the rules and regulations of your hospital.

Thanking you.

Yours faithfully,

PRINCIPAL
St. XAVIER'S CATHOLIC COLLEGE OF NURSING
NAGERCOIL - 629 003
K. K. DIST.

St. XAVIER'S CATHOLIC COLLEGE OF NURSING

Chunkankadai, Nagercoil,
Kanyakumari District,
Tamil Nadu - 629 003.

Tel : College : 04651 - 231740
Cell : 9840307884
Fax : 04651 - 230914
E-mail : xaviers_nursing@yahoo.com
reenaevancy@yahoo.com
Website : www.xaviersnsg.edu.in

Dr. A. REENA EVENCY, M.Sc. (N)., Ph.D.,
Principal

29/06/2015

To

Dr. Muthu Rethnam,

Muthu Neuro Hospital,

Chunkankadai.

Respected Madam,

Ms. Jasline shiny is a student of M.Sc. Nursing program in our college from Medical and Surgical Nursing Department. She is conducting study on" An experimental study to evaluate the effectiveness of swallowing exersice on swallowing and feeding performance among patients with head injury in selected hospital, kanyakumari District."

This is for the research project to be submitted to the Dr. M.G.R. Medical University in partial fulfillment of university requirement for the award of M.Sc. Nursing degree and will be beneficial in understanding and improving the health of the patients on swallowing and feeding performance with head injury .

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ST. XAVIER'S CATHOLIC COLLEGE OF NURSING
NAGERCOIL - 629 003
K. K. DIST.

St. XAVIER'S CATHOLIC COLLEGE OF NURSING

Chunkankadai, Nagercoil,
Kanyakumari District,
Tamilnadu - 629 003.

Tel : College : 04651 - 231740
Cell : 9840307884
Fax : 04651 - 230914
E-mail : xaviers_ nursing@yahoo.com
Website : www. xaviersnsg.edu.in

	Approved by Govt. of Tamilnadu	Approved by INC, New Delhi	Registered under T.N. Nursing Council	Affiliated to the T.N. Dr. M.G.R. Medi. Uni., Chennai
B.Sc. (N)	G.O. (Ms) No. 178/2006	18-29/3011-INC/2006	Ref. No. 34/NC/2006	Affln. II(1)/32947/06
P.B.B.Sc(N)	G.O. (Ms) No. 376/2008	18-29/4288-INC/2010	Ref. No. 7419/NC/2009	Affln. II(3)/2472/09
M.Sc (N)	-	18-29/7573-INC/2011	Ref. No. 4478/NC/2011	Affln. II(3)/37281/10

To

Respected Sir/ Madam,

Sub: Requisition to expert opinion and suggestion for the content validity.

I Jasline Shiny, M.Sc. Nursing II year student of St.Xavier's Catholic College Of Nursing, Chunkankadai, have selected the following topic, **"A quasi experimental study to assess the effectiveness of swallowing exercise on swallowing and feeding performance among patients with head injury in selected hospitals, Kanayakumari District"** for my dissertation to be submitted to The Tamil Nadu Dr. M.G.R. Medical University in the partial fulfilment of the requirement for award of Master of Science in Nursing.

I request you to go through the items and give your valuable suggestions and opinions to develop the content validity of the tool. Kindly suggest modifications, addition and deletions if any in the remarks column.

Thanking You,

Place: Chunkankadai
Date: 25.05.2015

Yours sincerely,

25/5/15

ENLOSURE:

1. Problem statement, objectives, and hypotheses of the study.
2. Demographic profile.
3. Gugging swallowing Screen Assessment Tool.
4. Evaluation Performa.

PRINCIPAL
ST. XAVIER'S CATHOLIC COLLEGE OF NURSING
CHUNKANKADAI
NAGERCOIL - 629 003
K. K. DIST.

ANNEXURES II

MUTHU NEURO CENTRE
18-51H, Ashok Nagar, Thiruvananthapuram Road, Chunkankadai, NAGERCOIL.
☎: 04652 - 222999, 220220, 220260, Cell: 9629101222, 9629123222, 9500935506.
E_mail: muthuneurocentre@gmail.com, tmrbin@gmail.com
www.muthuneurocentre.com

Dr. T. MUTHU RETNAM, M.S., (Gen), M.Ch., (Neurosurgery)
Consultant Neuro & Spine Surgeon.
Formerly Asst. Prof. of Neurosurgery.
Sree Chitra Tirunel Hospital, Trivandrum.

Date: 29.06.2015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that M.JASLINE SHINY,M.sc., nursing student, St.Xavier's catholic college of nursing, has conducted A study to assess the effectiveness of swallowing exercise on swallowing and feeding performance among patients with traumatic brain injury in MuthuNeuro Centre from 01/07/2015 to 31/07/2015.

MUTHU NEURO CENTRE

Dr.T. MuthuRetnam M.S., M.Ch., DNB (Neuro)
Consultant Surgeon

MUTHU NEURO CENTRE Ph: 222999 220220 220260 NAGERCOIL-3

Dr. T. MUTHURETNAM, M.S., M.Ch. (Neuro), DNB (Neuro)
NEURO & SPINE SURGEON
Reg. No: 55201

Ph : 235558

KEVIN NEURO CARE CENTRE

Head Injury, Spine and Stroke Speciality Centre

Vettoornimadam, Nagercoil - 3.

Ref.:

Date 29.06.2015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that M.JASLINE SHINY,M.sc., nursing student, St.Xavier's catholic college of nursing, has conducted A study to assess the effectiveness of swallowing exercise on swallowing and feeding performance among patients with traumatic brain injury in Kevin Neuro Centre from 01/07/2015 to 31/07/2015.

Medical Officer,
Kevin Neuro Care Centre
Vettoornimadam,
Nagercoil - 629 003

ANNEXURES III

LETTER SEEKING EXPERTS OPINION FOR THE VALIDITY OF THE TOOL

From

Ms.M.Jasline shiny.

M.Sc. Nursing II year,

St. Xavier's Catholic college Of Nursing, Chunkankadai.

To

Respected Sir/ Madam,

Sub: Requisition to expert opinion and suggestion for the content validity.

I Jasline Shiny, M.Sc. Nursing II year student of St.Xavier's Catholic College Of Nursing, Chunkankadai, have selected the following topic, **" A study to assess the effectiveness of swallowing exercise on swallowing and feeding performance among patients with traumatic brain injury in selected hospital Nagercoil at Kanyakumari district"** for my dissertation to be submitted to Tamilnadu Dr. M.G.R. Medical University in the partial fulfilment of the requirement for award of Master of science in Nursing.

I request you to go through the items and give your valuable suggestions and opinions to develop the content validity of the tool. Kindly suggest modifications, addition and deletions if any in the remarks column.

Thanking You,

Place: Chunkankadai. Yours sincerely,

Date: M.Jasline Shiny.

ENCLOSURE:

a. Problem statement, objectives, and hypothesis of the study.
b. Demographic variables and clinical variables.
c. Gugging swallowing screening scale
d. Evaluation Performa.

ANNEXURES-IV

EVALUATION CRITERIA CHECKLIST FOR VALIDATION

Instructions:

The expert is requested to go through the following criteria for evaluation. Three columns are given for responses and a column for remarks. Kindly please tick mark (✓) in the appropriate columns and give remarks. Interpretation column:

Column I – meets the criteria.

Column II - Partially meets the criteria.

Column III – does not meet the criteria.

S.No	CRITERIA	1	2	3	REMARKS
1.	Scoring -adequacy. -clarity. -simplicity.				
2.	Content -logical sequence. -adequacy. -relevance				
3.	Language -Appropriate. -clarity. -simplicity				
4.	Practicability -easy to score. -precise. -utility.				

Signature: Any other suggestion:

Name:

Designation:

Address:

CRITERIA CHECK LIST FOR VALIDATION OF THE TOOL

Instruction:

Kindly give your suggestions regarding the accuracy, relevance and appropriateness of the content. Kindly (✓) against specific columns.

PART-I

Validation of Demographic variables and clinical variables

Item	Very relevant	Relevant	Need for modification	Not relevant	Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					

PART-II

Validation of Gugging swallowing screening scale scoring.

Item	Very relevant	Relevant	Need for modification	Not relevant	Remarks
1					
2					
3					
4					

ANNEXURE V

LIST OF EXPERTS VALIDATED THE TOOL

1. Dr. T. Muthu Retnam.M.S.,(Gen)M.Ch.,(Neuro)
   Director ,
   Muthu Neuro Centre,Chunkankadai,629003
   Kanyakumari District.

2. Dr. D. Joseph .M.S.,(Neurosurgery)
   Director
   Kevin Neuro care centre, vettoornimadam.
   Kanyakumari district.

3. Mrs .Sheeba, M.sc.(N)
   Reader,
   Christian College of Nursing, Neyyoor,
   Kanyakumari District.

4. Dr.Sharmila, PhD.
   Reader,
   Christian College of Nursing, Neyyoor,
   Kanyakumari District.

5. Mrs. Josphine sudha,M.sc.(N)
   Reader,
   P.S. College of nursing, Thalakulam
   KanyaKumari District.

ANNEXURE VI

CERTIFICATE OF ENGLISH EDITING

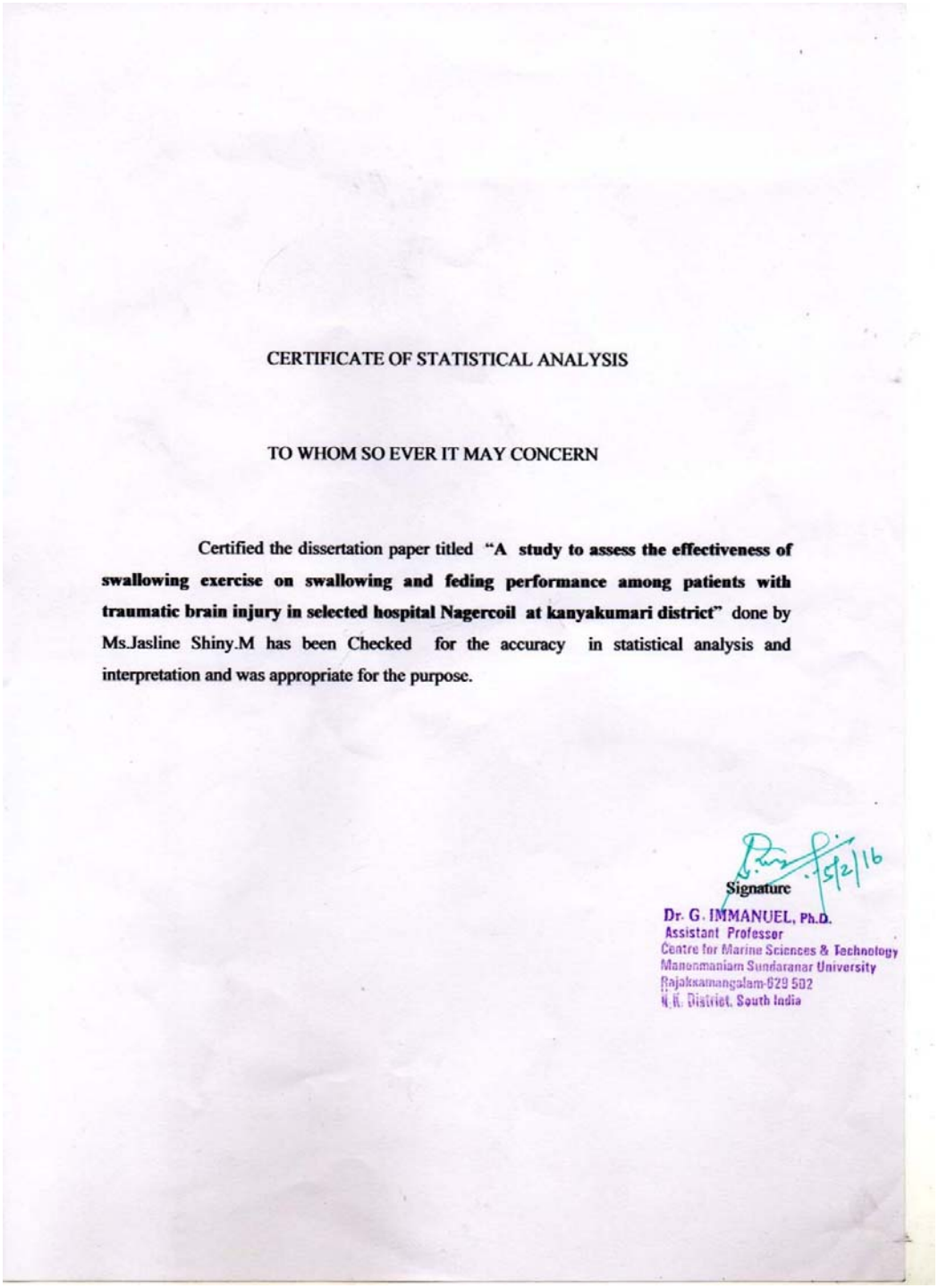
CERFIFICATE OF EDITING

Certified the dissertation paper titled "A Study to assess the effectiveness of swallowing exercise on swallowing and feeding performance among patients with traumatic brain injury Selected Hospital at kanyakumari district" by Jaslin Shiny has been Checked for accuracy and correctness of English language usage and that the language in the tool is lucid, unambiguous, Free of grammatical and spelling errors and apt for the purpose.

Principal
K.M.P. NATIONAL NURSERY AND
PRIMARY SCHOOL,
Thingal Nagar, Neyyoor P.O.

ANNEXURE VII

CERTIFICATE OF STATISTICAL ANALYSIS AND INTERPRETATION



CERTIFICATE OF STATISTICAL ANALYSIS

TO WHOM SO EVER IT MAY CONCERN

Certified the dissertation paper titled **"A study to assess the effectiveness of swallowing exercise on swallowing and feding performance among patients with traumatic brain injury in selected hospital Nagercoil at kanyakumari district"** done by Ms.Jasline Shiny.M has been Checked for the accuracy in statistical analysis and interpretation and was appropriate for the purpose.

5/2/16

Signature

Dr. G. IMMANUEL, Ph.D.
Assistant Professor
Centre for Marine Sciences & Technology
Manonmaniam Sundaranar University
Rajakkamangalam-629 502
K.K. District, South India

ANNEXURE VIII

TOOLS FOR DATA COLLECTION

PART-1:

DEMOGRAPHIC VARIABLES:

1) Age :
    a) 20 – 30 yrs
    b) 31 – 40 yrs
    c) 41 – 50 yrs
    d) 51 and above
2) Gender:
    a) Male
    b) Female
3) Educational status:
    a) Illiterate
    b) School Education
    c) Under Graduate
    d) Post graduate
4) Occupation:
    a) Unemployed
    b) Self-Employed
    c) Government Employee
    d) Private Employee
5) Marital status
    a) Single
    b) Married
    c) Widow/ Widower
    d) Separated

PART-II:

CLINICAL VARIABLES:

6) Dysphagia (Self-Reported)
   a) Yes
   b) Not sure
7) Conditions of Oral Cavity
   a) Dry
   d) Moist
   c) Ulcerated
   d) Coated
8) Types of Feeding:
   a) Partial
   b) Non – Oral
   c) Oral

PART –III:

Guss

(Gugging Swallowing Screen)

1) **Preliminary Investigation/Indirect Swallowing Test**

	yes	No
Vigilance (the patient must be alert for at least for 15 minutes	1	0
Cough And /Or Throat Clearing(voluntary cough) (patient should cough or clear his or her throat twice)	1 ☐	0 ☐
Saliva Swallow: • Swallowing successful	1 ☐	0 ☐
• Drooling	0 ☐	1 ☐
• Voice change (hoarse, gurgly, coated,weak)	0 ☐	1 ☐
sum		(5)
		1-4=investigate further 5=continue with part 2

2) **Direct swallowing test(material aqua bi, flat teaspoon, food thickener, bread)**

In the following order:	1	2	3
	Semisolid *	Liquid **	Solid ***
Deglutition: • Swallowing not possible • Swallowing delayed (>2 sec.) (solid textures> 10 sec.) • Swallowing successful	0 1 2	0 1 2	0 1 2
Cough (involuntary): **(before, during of after swallowing- until 3 minutes later)** • Yes • no	0 ☐ 1 ☐	0 ☐ 1 ☐	0 ☐ 1 ☐
Drooling: • Yes • no	0 ☐ 1 ☐	0 ☐ 1 ☐	0 ☐ 1 ☐
Voice change:(listen to the voice before and after swallowing patient should speak" o") • Yes • no	0 ☐ 1 ☐	0 ☐ 1 ☐	0 ☐ 1 ☐
Sum:	(5)	(5)	(5)
	1-4=investigate further 5=continue liquid	1-4=investigate further 5=continue solid	1-4=investigate further 5=normal
Sum:(indirect swallowing test AND direct swallowing test)			**(20)**

Guss

(gugging swallowing screen)

Guss- evaluation

Results		Severity Code	Recommendations
20	Semisolid/liquid and solid texture successful	Slight/no dysphagia minimal risk of aspiration	• normal diet • regular liquids (first time under supervision of the SLT or a trained stroke nurse)
15-19	Semisolid and liquid texture successful and solid unsuccessful	Slight dysphagia with a low risk of aspiration	• dysphagia diet(pureed and soft food) • liquids very slowly-one sip at a time • funcional swallowing assessments such as fiberoptic endoscopic evaluation of swallowing (FEES)or videofluoroscopic evaluation of swallowing(VFES) • refer to speech and language therapist(SLT)
10-14	Semisolid swallow successsful and liquids unsuccessful	Moderate dysphagia with a risk of aspiration	Dysphagia diet beginning with: • semisolid textures such as baby food and additional parenteral feeding. • All liquids must be thickened • Pills must be crushed and mixed with thick liquid. • No liquid medication • Further functional swallowing assessments(FEES,VFES) • Refer to speech and language therapist(SLT) Supplementation with nasogastric tube or parenteral
0-9	Preliminary investigation unsuccessful or semisolid swallow unsuccessful	Severe dysphagia with a high risk of aspiration	• NPO (non per os = nothing by mouth) • Further functional swallowing assessment (FEES,VFES) • Refer to speech and language therapist(SLT) Supplementation with nasogastric tube or parenteral

GLASGOW COMA SCORE

Eye(s) opening

Spontaneous	4
To speech	3
To pain	2
No response	1
Verbal response	
Oriented to time,place,person	5
Confused/disorientated	4
Inappropriate words	3
Incomprehensible sounds	2
No response	1
Best motor response	
Obeys commands	6
Moves to localised pain	5
Flexion withdrawns from pain	4
Abnormal flexion	3
Abnormal extension	2
No response	1
Best response	15
Comatose patient	8 or less
Totally unresponsive	3

ANNEXURE IX

PROCEDURE OF SWALLOW EXERCISES

INTRODUCTION:

Good morning, I am student of St. Xavier's catholic college of nursing, individuals with dysphagia or difficulty in swallowing often complain of coughing when eating, food sticking when eating, throat clearing when eating, feeling of something remaining in their mouth or throat after swallowing, and other discomfort related to eating. They may avoid food that is more difficult for them to swallow. So exercising your swallowing muscles is the best way to improve your ability to swallow.

DEFINITION:

DYSPHAGIA EXERCISE:

Dysphagia exercise is a process of closing the airway at the vocal fold level before and during swallow, for increasing tongue base retraction and pressure generation, and for clearing residue after the swallow.

BENEFITS:

- To Increase the retraction and pressure during the pharyngeal phase of the swallow and reduce the amount of food residue in the valleculae of the throat & thereby possibly aspiration/penetration.
- To increase anterior tilting of arytenoid and retraction of tongue base for patients who exhibit penetration into the airway with aspiration after the swallow.
- To close the airway at the vocal fold level before and during the swallow and to clear residue after the swallow, delayed airway closure, reduced airway closure, delayed pharyngeal swallow, poor oral control of liquids with premature loss into the pharynx.

Effortful swallow

1. Place the in patient comfortable position.
2. Swallow the saliva as hard as the person can.
3. Repeat for 5-10 times.
4. Continue for 3 times a day.

Supra – glottis swallow:

1.Place the patient in comfortable position.

2. Take a deep breath with the food in the mouth.

3. Hold the breath and swallow.

4. Cough to clear any residues or food.

5. Perform the exercise without food.

6. Repeat for 5-10 times.

7. Continue for 3 times a day.

Super supraglottic swallow maneuver:

1. Place the patient in comfortable position.

2. Take a deep breath without food in the mouth.

3. Hold the breath.

4. Bear down while swallowing saliva.

5. Cough to clear any residues of saliva.

6. Repeat this with food in the mouth. Repeat for 5-10 times.

7. Continue for 3 times a day.

ANNEXURE X

FORMULAS USED FOR DATA ANALYSIS

DESCRIPTIVE STATISTICS

Mean $$\acute{x}=\frac{\sum x}{N}$$

Standard deviation $$s=\sqrt{\frac{\sum\left(x-\acute{x}\right)^2}{n-1}}$$

INFERENTIAL STATISTICS

Independent 't' test $$t=\frac{\left|x_1-x_2\right|}{\sqrt{\frac{{s_1}^2}{n_1}+\frac{{s_2}^2}{n_2}}}$$

$$s=\sqrt{\frac{\left(n_1-1\right){s_1}^2+\left(n_2-1\right){s_2}^2}{n_1+n_2-2}}$$

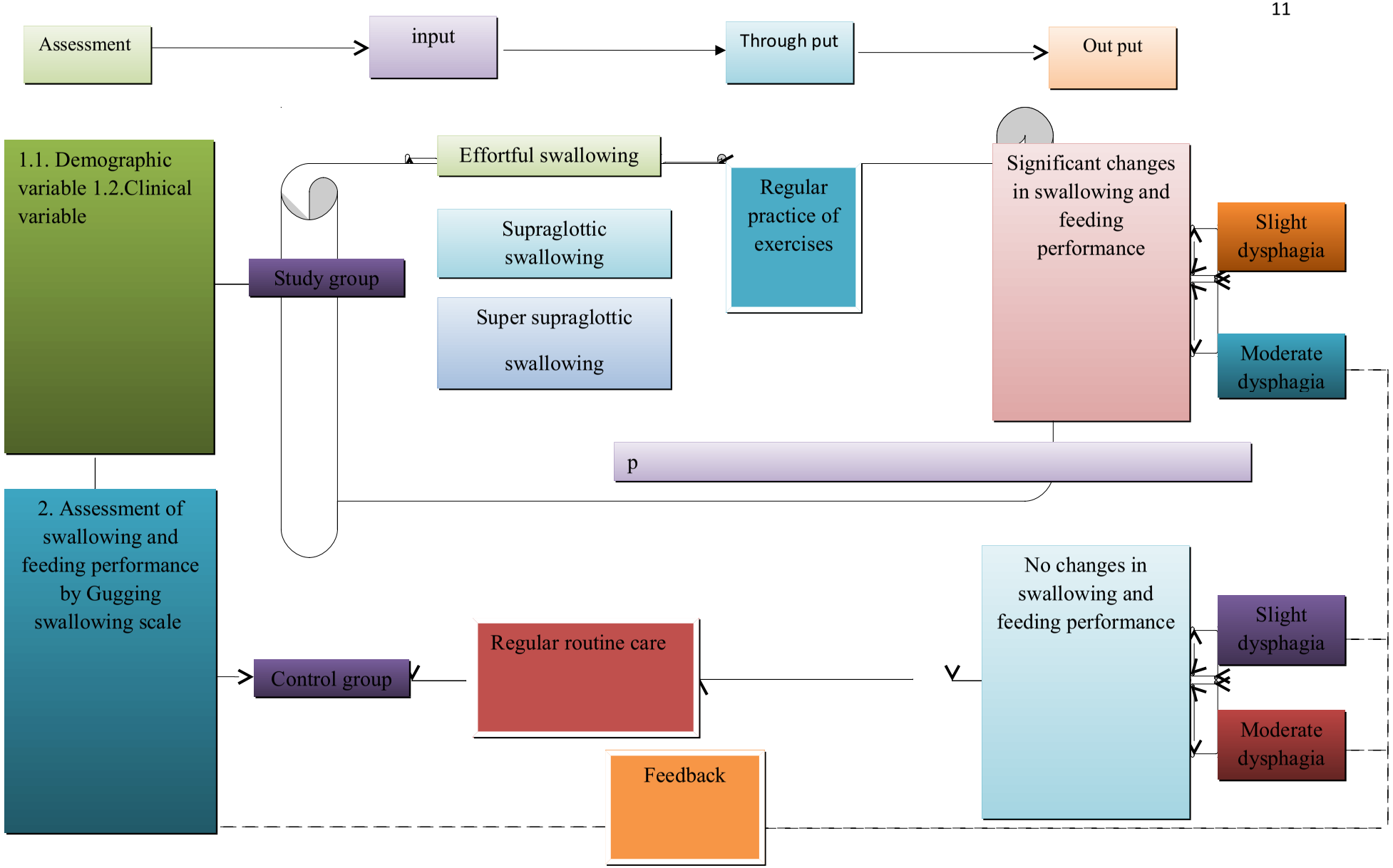
Paired 't' test $$t=\frac{\acute{d}\sqrt{n}}{s}$$

$$s=\sqrt{\frac{\sum\left(d-\acute{d}\right)^2}{n-1}}$$

Chi-Square test $$x^2=\sum\frac{\left(o-e\right)^2}{e}$$

ANNEXURE XI

PHOTOGRAPHS OF CONDUCTING STUDY



Conceptual Framework On Ludwig Von Bertalanffy (1968) General System Theory.